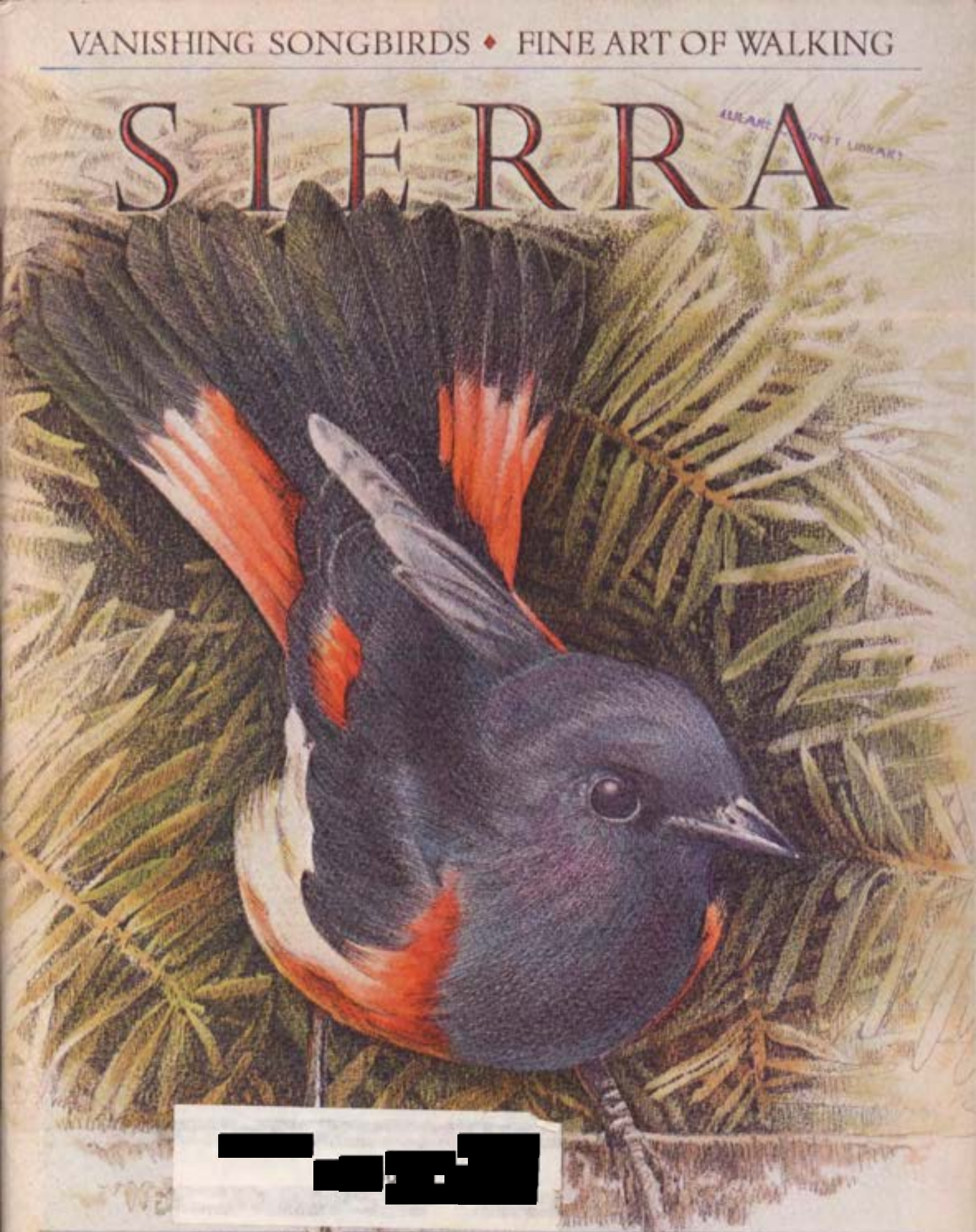
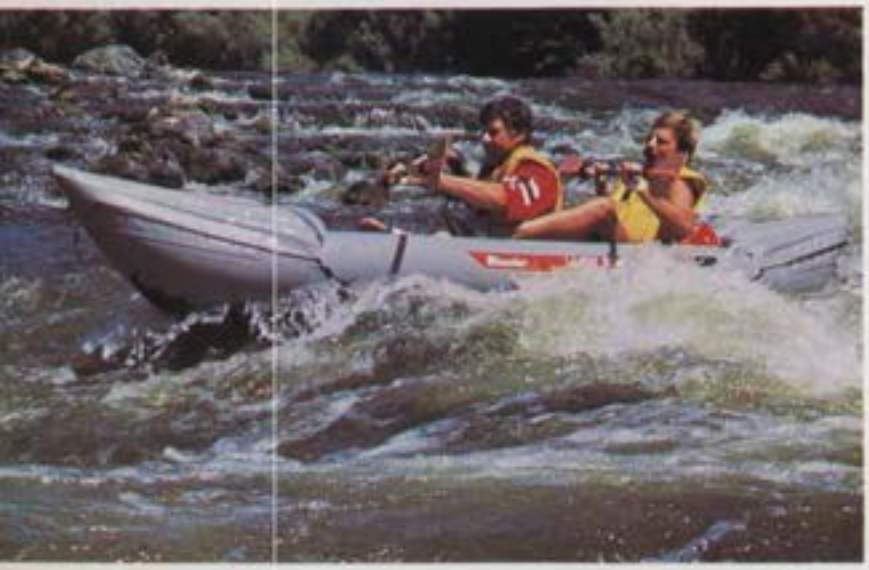
VANISHING SONGBIRDS • FINE ART OF WALKING

SIERRA



[redacted]

MARCH/APRIL 1986 $2.50



KAYNOE

Kayak and Canoe

The Versatile Inflatable by Sevylor

From stem to stern, the brand new **SEVYLOR TX390 "KAYNOE"—KAYAK/CANOE** is an ideal inflatable for canoeing, kayaking, river running, backpacking, fishing or just plain relaxing.

One of the most stable, maneuverable and least prone-to-tip kayak/canoe on the water, anyone from 10 to 100 can handle it easily. Constructed of Sevytex, a newly developed, super-strong PVC material, it is polyester reinforced for greater safety, endurance and durablitiy.

A roomy 13' long, with plenty of leg room, it is cushion-comfortable, lightweight enough to carry anywhere, storagable in closet or car trunk and maintenance-free.

For brawn and beauty in a versatile, multi-purpose inflatable, go with Sevylor TX390, the most reliable name in affordable inflatable watercraft.

See it at your local dealer or write for a complimentary brochure.

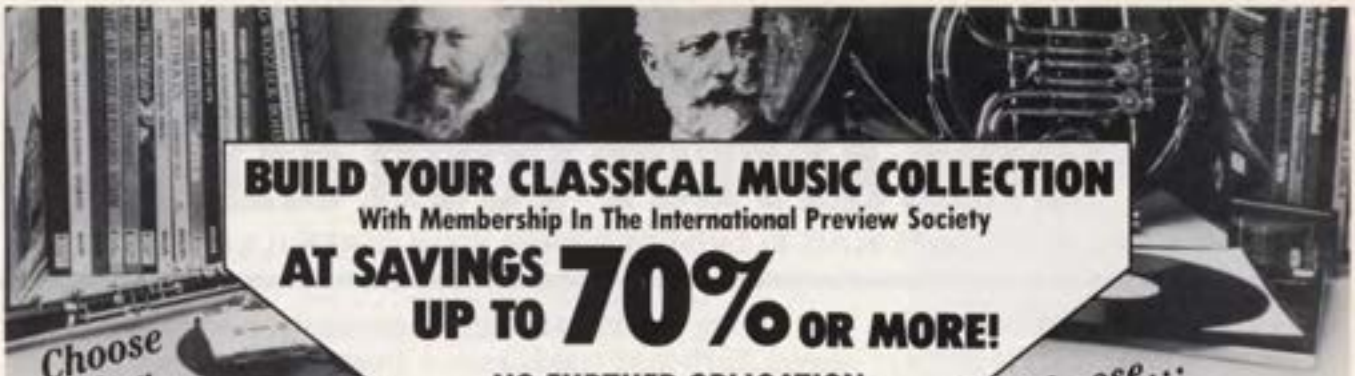
Sevylor

ZODIAC

A member of ZODIAC GROUP

6371 Randolph Street, Los Angeles, CA 90040
(213) 727-6013
IN CANADA: 3182 Orlando Dr., Unit 2,
Mississauga, Ontario L4V 1R5

1. SEVYTEX MATERIAL
   Reinforced PVC Coating
   1100 decitex Polyester Grating
2. SPECIAL TUBULAR I-BEAM FLOOR CONSTRUCTION
3. 2-DIRECTIONAL STRAKES
4. 2-ADJUSTABLE KAYAK SEATS
5. 4-MOLDED FITTINGS FOR WOODEN CANOE SEATS
6. 3-BOSTON VALVES
7. SELF-BAILING DRAIN PLUG
8. FRONT & REAR SPRAY COVERS
9. 2-WOODEN CANOE SEATS



BUILD YOUR CLASSICAL MUSIC COLLECTION

With Membership In The International Preview Society

AT SAVINGS UP TO 70% OR MORE!

NO FURTHER OBLIGATION TO BUY–EVER!

10-DAY FREE AUDITION

Choose either...

3 Digital Single Albums for just $1 each

(plus shipping & handling)

ALL SINGLE ALBUMS AVAILABLE ON COMPACT DISC

Dvořák, Symphony No. 9 (From The New World) Chicago Symphony/Solti. London DIGITAL 115168

America, The Dream Goes On The Boston Pops led by John Williams. Philips DIGITAL 115134

Saint-Saëns, Conc. No. 3; Wieniawski, Conc. No. 2 Perlman, violin. DG DIGITAL 115268

Bach, Organ Works Daniel Chorzempa, organ. Toccata & Fugue, others. Philips DIGITAL 115193

Wagner, Orchestral Highlights From The Ring Vienna Phil./Solti. London DIGITAL 115426

Brahms, 21 Hungarian Dances Vienna Philharmonic Orchestra/Abbado. DG DIGITAL 115408

Vivaldi, The 4 Seasons Standage, violin. English Concert/Pinnock. Archiv DIGITAL 115356

James Galway & Henry Mancini: In The Pink *The Pink Panther*, more. RCA DIGITAL 151758

The Canadian Brass: High, Bright, Light And Clear Baroque favorites. RCA DIGITAL 144529

Falla, Nights In The Gardens Of Spain; more Alicia de Larrocha, piano. London DIGITAL 115410

Carmen (Film Highlights) Migenes-Johnson, Domingo/Maazel. Erato DIGITAL 154105

Sousa, Stars & Stripes Forever Philip Jones Ensemble/Howarth. London DIGITAL 115051

Sunday In The Park With George Grammy-winning Original Cast Album. RCA DIGITAL 154014

Romantic Organ Music Peter Hurford plays Brahms, Mendelssohn, more. Argo DIGITAL 115221

Mozart, Symphonies Nos. 40 & 41 (Jupiter) Chicago Symphony/Levine. RCA DIGITAL 104810

Pavarotti: Mamma Title song, *Vieni sul mar, Vivere*, others. London DIGITAL 115310

Kiri te Kanawa: Mozart, Opera Arias London Symphony/Davis. Philips DIGITAL 115097

Mozart, Piano Conc. Nos. 12 & 20 Rudolf Serkin; London Sym./Abbado. DG DIGITAL 115062

Debussy, La Mer; Nocturnes Boston Symphony Orchestra/Davis. Philips DIGITAL 115068

Horowitz At The Met Scarlatti, Chopin, Liszt & Rachmaninoff. RCA DIGITAL 151876

How You Build Your Classical Music Library

You start saving now with fabulous record or cassette collector's sets or 3 digital single records, cassettes or compact discs at their low introductory prices. Then about every four weeks you'll receive Preview, the Society's magazine, plus six special sale issues—19 in all! There is never an obligation to buy, but if you want the Main Selection, do nothing. It will come to you automatically. Or you may order an alternate or no selection by telling us on a Notification Card always provided and returning it by the date on it. You always have at least 10 days to decide but if you don't, and the Main Selection is sent without your wanting it; return it at our expense. Cancel at any time by writing to us. Or remain a member and enjoy 50% Bonus savings on the world's finest classical music!

Attention Compact Disc Collectors: All 20 single recordings above also available on Compact Disc. Just check the CD Box on coupon.

(CD members serviced by the Compact Disc Club. Some aspects vary. Full details will follow with same 10-day no obligation, return privilege.)

IPS 510

or choose...

up to 3 Multi-Album Collector's Sets

At Fabulous Introductory Prices

(plus shipping & handling)

MULTI-ALBUM SETS	ORDER NUMBER	SUGGESTED LIST PRICE	YOU PAY ONLY	You Save
Beethoven, The 9 Symphonies. Karl Böhm, Vienna Philharmonic. 8 Records or 6 Cassettes. Deutsche Grammophon	205040	$79.84	**$14.98**	81%
Schubert, The 10 Symphonies. Neville Marriner, St. Martin-in-the-Fields. 7 Records or 5 Cassettes Philips DIGITAL	215041	$48.86	**$12.98**	73%
RCA/MET— 100 Singers, 100 Years. Montaural. 8 Records or 8 Cassettes RCA	254259	$69.95	**$14.98**	79%
Mozart Symphonies, Vol. 6 (Late). Hogwood, The Academy of Ancient Music. 4 Records or 3 Cassettes L'Oiseau-Lyre DIGITAL	215091	$39.92	**$ 9.98**	75%
Handel, Messiah. Monteverdi Choir, English Baroque Soloists led by John Eliot Gardiner. 3 Records or 3 Cassettes Philips DIGITAL	215049	$29.94	**$ 7.98**	74%

MAIL TO: International Preview Society • P.O. Box 91406 • Indianapolis, IN 46291

☐ **Yes!** Please accept my membership in The International Preview Society and rush me, **either** the multi-album collector's sets at their remarkable introductory members' prices **or** three digital single recordings for just $1 each, and bill me later.

I understand that at the end of my **free 10-day audition,** I may return my introductory selections and owe nothing, or take advantage of the fabulous savings and keep them under the terms outlined in this offer. **As a society member, I am never under any obligation to buy any future recordings.** (A shipping/handling charge and applicable sales tax added to each shipment.)

☐ **DIGITAL SINGLE ALBUMS** *(Also available on Compact Disc!)*

Check One: PQ ☐ **Records** PR ☐ **Cassettes** AR ☐ **Compact Discs**

Rush me these 3 single albums (order by number)

or

☐ **MULTI-ALBUM SETS** Save on **1-2-** or **3** collector's sets.

Check One: ☐ **Records** ☐ **Cassettes**

(Sorry, no more than 3 at these prices.)

Rush me these sets. (order by number) PP PT PU

☐ MR. ☐ MRS. ☐ MISS First Name Initial / Last Name (PLEASE PRINT)

ADDRESS APT

CITY STATE ZIP

TELEPHONE ( ) Area Code

Please sign here

Offer good in continental USA only; one membership per family. All applications subject to review, and we reserve the right to reject any applications or request additional information.

VBS45 P-N3 P-PY

HOW LESS LEAD IN GASOLINE WILL AFFECT YOUR CAR

USE OF ALCOHOL-GASOLINE BLENDS REQUIRES YOUR CAREFUL SELECTION

The Environmental Protection Agency is reducing the amount of lead allowed in leaded gasoline by more than 90%. General Motors supports this effort to reduce lead in the atmosphere. But our customers need to know how this action may affect their vehicles.

In simple terms, continue with the same gasoline you've been using. You probably won't notice any difference at your service station. Just be sure your gasoline meets the requirements below.

For post-1974 model cars and light trucks (less than 6,000 lbs.). Continue to use *unleaded* gasoline only. The new lower-lead limits for leaded gasoline *are still too high:* lead in gasoline will harm the emission-control system.

For 1971-74 model cars and light trucks. Use either unleaded or the new lower-lead gasoline. These vehicles were designed to run on either one.

For all pre-1971 model cars and trucks. Use the new lower-lead gasolines. These vehicles need leaded gas to lubricate exhaust valves. The lead raises octane ratings and helps to avoid "knocking" and "pinging." The lead is most important during continuous high-speed, high-load conditions such as towing a heavy trailer or large boat over a long distance. In a pinch, you can even use unleaded gas for normal driving.

Tip: Use only enough octane to avoid frequent knocking. An occasional "ping" won't harm the engine.

The new lower-lead gasolines should *always* be used in:

- 1971-78 trucks over 6,000 lbs.
- post-1978 trucks over 8,500 lbs.

The effect of alcohol blends. To meet the new regulations, oil refiners will turn to other methods to maintain or increase octane ratings. Some will elect to refine gasoline more intensively. Others may add octane enhancers such as ethanol and methanol (more informally known as grain alcohol and wood alcohol).

General Motors supports the use of such alternative fuels to lessen our nation's dependence on imported oil. But to avoid operating and other problems, don't use gasoline containing more than 10 percent ethanol or 5 percent methanol. And in the case of methanol, be sure it contains cosolvents (to prevent separation of the alcohol from the gasoline) and corrosion inhibitors.

General Motors is taking steps to ensure that its future vehicles can operate problem-free with gasoline containing alcohol. For now, you should know the contents of the fuel going into your gas tank. That's why we support the requirement that gas pumps show the alcohol content of the fuel. Such labels are being used in some states, but they are needed nationwide.

To get the efficiency, driveability and performance we design into your GM vehicles, be sure you use the right fuel. The proper identification and use of gasoline is good for both GM customers and GM cars and trucks.

This advertisement is part of our continuing effort to give customers useful information about their cars and trucks and the company that builds them.

GM
MARK OF EXCELLENCE

Chevrolet • Pontiac
Oldsmobile • Buick
Cadillac • GMC Truck

SIERRA

SIERRA MAGAZINE MARCH/APRIL 1986 VOLUME 71/NUMBER 2

FEATURES

DEPARTMENTS

COVER: The American redstart (*Setophaga ruticilla*), identified by its distinctive salmon-streaked tail, is becoming a less frequent visitor to America's forests. To find out why, see Joseph Wallace's story on page 44. Illustration by Dugald Stermer.

Sierra (USPS 495-920) (ISSN 0161-7362), published bimonthly, is the official magazine of the Sierra Club, 730 Polk St., San Francisco, CA 94109. Annual dues are $29. Members of the Sierra Club subscribe to *Sierra* through their dues. Nonmember subscriptions: one year $12, two years $20; foreign $16; single copy $2.50. Second-class postage paid at San Francisco, CA, and additional mailing offices.

POSTMASTER: Send address changes to Sierra Club Member Services, 730 Polk St., San Francisco, CA 94109. Along with your old and new addresses, please include a *Sierra* address label. Telephone (415) 776-2211 (voice); (415) 398-5384 (TDD).

Oil and Gas Leasing, page 38.

Disappearing Songbirds, page 44.

Grand Canyon Music, page 59.

A Fallen Tree, page 82.

SIERRA

James Keough • *Editor*
Kate MacIntyre • *Advertising Director*
Bill Prochnow • *Art Director*

Joan Hamilton, Jonathan F. King, Annie Stine • *Associate Editors*
Keiko Ohnuma • *Copy Editor*
David Modjeska • *Editorial Assistant*
Mark Vaz • *Editorial Intern*
Linda K. Smith • *Art and Production Manager*
Dale Smith • *Production*
Gary Eagling, Robert Frame, Alice Weaver • *Sales Representatives*
Lorraine Vallejo • *Classified Advertising*
Paula Koster-Kerick • *Advertising Assistant*
Margaret W. Rowlands • *Distribution Assistant*

Editorial, Advertising and Business Offices: 730 Polk St., San Francisco, CA 94109; (415) 776-2211. East Coast Advertising: 1501 Broadway, Suite 1900, New York, NY 10036; (212) 682-1257. Detroit Advertising: Catherine Miller, 1042 Maryland, Grosse Pointe, MI 48230; (313) 824-9296. West Coast Advertising: 3934 W. 5th St., #201, Santa Ana, CA 92703; (714) 554-1261. Unsolicited manuscripts and photos must include a self-addressed, stamped envelope. We suggest that all photo submissions be insured or registered. *Sierra* is not responsible for material lost or damaged in the mail.

EDITOR'S NOTE

MANY OF YOU WILL NOTICE, as you glance through this issue, that we've made a number of major changes in the design and content of *Sierra*. For the last two years the magazine staff has been looking for ways to make this publication an even more effective and authoritative voice for the environment. We made some minor changes during that period, but for the most part we saved our ideas until the time was right for a complete overhaul.

That day has arrived. This issue is the first installment of a completely redesigned *Sierra*. Art Director Bill Prochnow has chosen new (and larger) typefaces to help guide you through the magazine. The editors have also rethought each of the departments, changing most of them to bring you more information about the issues that concern you.

Here are some of the specifics.

We've replaced the old "News" section with a new department called "Afield." It provides quick information on news and trends, updates of ongoing issues, and facts and fancy on a wide range of environmental topics. As a regular feature in this department, "Scorecard" lists major environmental victories (and losses) in Congress and the courts; another regular, "Field Notes," quotes a significant passage from the work of an important writer or thinker.

We've also revamped the "Politics" section by breaking it into two departments, "Priorities" and "In Depth." Both focus on specific issues that have direct impact on our daily lives—topics such as energy, clean water and air, public lands, toxics, and endangered species. "Priorities" will cover several stories in each issue of the magazine; as its name implies, "In Depth" will cover only one, but in greater detail.

Last July we noted the passing of Bob Irwin, the originator of the "Observer" column. Rather than replace Bob (an impossible task), we've decided to replace the "Observer" with two new departments that report on activists and volunteers in the United States and around the world.

The first of these, "Grassroots Profile," tells the story of an individual who has played a major role in a community's conservation movement. In this issue that person is Marion Stoddart, whose unstinting efforts contributed to the rebirth of Massachusetts' once-polluted Nashua River.

The second new department in the back of the magazine is "Hot Spots," which covers local conservation issues that epitomize the problems being worked on by volunteers everywhere. There are, of course, many more worthy people and important local issues than we have room to cover, but we hope that by mentioning a few in each issue of *Sierra* we will celebrate the work of all.

The rest of the departments remain unchanged (except for their design), although "Sierra Notes" has become a department unto itself. It lists significant Sierra Club events as well as noteworthy chapter and group activities, environmental awards, and other items of interest to our readers.

You'll notice I haven't mentioned the features or the cover logo. A quick look will tell you they haven't changed. They will, but that constitutes the second half of our redesign effort. Look for those changes in the May/June issue—and let us know what you think of the ones we've made so far.

James Keough

LETTERS

MOTT MISSIVE AND MORE

Thank you very much for the interview in the January/February *Sierra*. However, the last paragraph on page 133 disturbed me. It reads, "As I said to President Reagan, 'Let's forget about what we don't agree on. Let's do the things we can agree on, and let's get on with it and get things done.'" It should have read, "As I said to Executive Director Doug Wheeler. . . ." I made this statement when I met with him to discuss areas of mutual interest. I would not make such a statement to the President.

William Penn Mott, Jr.
Director, National Park Service
Washington, D.C.

I enjoyed Joan Hamilton's splendid interview with William Mott. Strange that the President would appoint a man so opposed to the policies of Watt and Burford; for this he deserves credit. The article made no mention of Maine's national park, Acadia; apparently no problems exist there.

C. Briggs Downer, Jr.
South Thomaston, Maine

It appears that with but one exception, the tallgrass prairie preserve, Mr. Mott's priorities are in the development of existing national parks. With this in mind, it is curious that no mention is made of John Muir's lost jewel—Hetch Hetchy Valley—which is within Yosemite National Park. In terms of undeveloped resources within a national park, there is none to compare with this. The world owes it to Muir to eliminate the one tear in his life by restoring Hetch Hetchy Valley.

Stephen F. Miller
Cypress, Texas

RETALIATORY STRIKES

"Nuclear Exchanges" (January/February 1986) was a piece of drivel. If its intent was to show the complexities of the nuclear arms debate, it failed to present a balanced discussion, while damaging the Sierra Club's credibility as a responsible proponent of arms control. Why must Club members read this piece of editorial schizophrenia instead of a clear definition of Club policy for political action?

The Sierra Club should abandon its pussyfooting on the nuclear arms issue and take an aggressive role in attacking those aspects of nuclear arms proliferation that have dangerous and indisputable effects on the environment. Such initiatives may include investigations of improper disposal of toxic wastes at weapons production facilities and action on the hazardous buildup of nuclear weapons waste.

David Manhart
Citrus Heights, Calif.

"Nuclear Exchanges" was excellent, besides having a good pun for a title. It was strong stuff, the kind of thing environmentalists need to say more often.

Two comments: You say John Birks and Paul Crutzen "discovered that nuclear war could cause the atmospheric effect now referred to as nuclear winter." That's going too far. The only thing new is that a catchy phrase and a collection of establishment types have made an old idea well known.

Second, environmentalists must understand that it really doesn't matter whether there is a nuclear war or not; the only difference between nuclear war

and the other ways we destroy the planet is the length of time it takes.
Alazen Jennings
San Jose, Calif.

INTEGRATED THEFT MANAGEMENT

In addition to the ironies mentioned by Gary Ferguson ("Roadside Attractions," January/February 1986) in stealing trees from the national forests, there is the further irony that the thieves are stealing the same kinds of trees the Forest Service and private forest owners would like to remove from stands scheduled for rotational harvest but often don't because of the cost.

Why not get the thieves and landowners together to help each other? The Forest Service could direct the thieves into stands that need thinning, and allow them to do the prescribed treatment free of charge. The thieves-turned-silviculturists could then sell the trees to landscapers for a profit.
Paul R. Sheppard
Closter, N.J.

LOVE IT BUT LEASH IT

Your January/February cover projects lots of positive elements: the outdoors in winter, man's best friend, health and exercise. I'm with you there.

However, nordic trails are no place for dogs. Try skiing (where allowed) with and without dogs. You'll see why.
Alan H. Tracy
Bend, Ore.

TOO SOFT ON THE SERVICE

After cataloging a long series of offenses being committed by the Forest Service and tracing the blame all the way up to the Assistant Secretary of Agriculture ("The Rise and Demise of Forest Planning," January/February 1986), Dennis Hanson marshmallows out. He concludes with a limp suggestion that the Forest Service and the public will have to sit down and agree on how to use and protect our forests.

For those of us who have tried that approach for seven years while the Forest Service continued to maim our national forests with massive roads and clearcuts, it would be naive—nay, derelict—to place any more hope in those smooth-talking butchers of ecosystems.

It is equally fruitless to send comments to the Forest Service on their draft management plans, unless we follow up their brushoffs with lawsuits.

It is high time *Sierra* began to publish some realistic recommendations on what must be done.
Edward C. Fritz
Dallas, Texas

In many respects, Dennis Hanson's article echoed the experiences of Wisconsin conservationists. I was disappointed, however, that the article contained only some mild rhetoric concerning the planning process.

Regional foresters are working with timber and road goals that are insensitive to local needs and apparently biased toward the profits of timber companies. Even with good intentions, forest managers have been saddled with an inadequate and often incomprehensible planning tool: FORPLAN. The model attempts to maximize the monetary output of selected forest commodities under alternative management prescriptions and constraints. Aside from the difficulty of placing a value on such things as wildlife habitat, forest aesthetics, and watershed protection, the model is essentially aspatial. Within the often vast management areas, the model assumes homogenous conditions. Gone is the ability to determine how soils, hydrography, topography, past practices, and other geographically related factors interact to produce unique local conditions. Gone is the ability to identify subareas worth conserving.

There is also evidence that other Forest Service planning tools are inadequate. STEMS (Stand and Tree Evaluation and Modeling System), a timber-growth modeling tool used to derive timber-yield tables for FORPLAN, predicted that stands of mature timber would more than triple their growth rate in the next ten years!

At this point I can only hope that in one of the many likely appeals throughout the country the courts will look closely at the techniques the Forest Service is using to manage *our* forests for the next 10, 50, and 150 years.
Stephen J. Ventura
State Conservation Chair
John Muir Chapter
Madison, Wis.

HAIL TO THEE, BLITHE SPIRIT! BIRD THOU NEVER WERT

Quetzalcoatlus northropi ruled the skies 65 million years ago, and in January its 20th-century descendant soared over the Mojave Desert in California.

For more than a year, experts in the fields of paleontology and aerodynamics have been creating a replica of the giant pterodactyl. But this is no static statue: One of the goals of the project was to create a lifelike version of the creature, complete with 18-foot wingspan, that would be able to fly.

"Very little is known about how natural fliers such as birds combine their sensing devices, brains, and muscles to fly effectively," says the replica's designer, Paul MacCready. "The challenge is especially difficult with this pterodactyl; it doesn't even have a tail to help with stability and control."

MacCready's reptile rose to the challenge by going high-tech. In response to an on-board computer, the replica maintains stable flight by moving its head from side to side, extending fingers midway out on the wings, twisting the wings and swinging them forward and backward. "All this goes on while the battery-powered muscles flap the wings to provide propulsion," MacCready explains.

In addition to flying the skies of the desert, the pterodactyl will make a cameo appearance in "On the Wing," the National Air and Space Museum's new large-screen film exploring flight in all its forms. —*Annie Stine*

SCORECARD

- ***The 1985 Farm Bill*** signed by President Reagan includes soil and wetland conservation measures.
- ***The Kentucky Wilderness Act*** designates 13,330 acres as the Clifty Wilderness Area.
- ***Synthetic Fuels Corp.*** dies by congressional rescission of its entire $18-billion budget.
- ***The low-level nuclear waste bill*** passed by Congress mandates new schedules and incentives for regional disposal of low-level radioactive wastes.
- ***Wilderness water rights*** were upheld by a federal court in Colorado.
- ***Alaska's Chugach National Forest plan*** cuts Forest Service timber offerings in half and doubles primitive recreation areas.

ICE MAN COMETH, NUKE MAN GOETH

Once he designed the lightest and smallest nuclear fission bomb ever made; then he designed the largest-yield fission weapon ever detonated. Now Ted Taylor cools cheese.

For physicist Taylor, the subject of John McPhee's book *The Curve of Binding Energy*, it's been a long road from Los Alamos National Laboratory in New Mexico to Kutters Cheese in upstate New York. Honored many times for his work on nuclear power, Taylor is now an advocate of other, safer ways of meeting our energy needs. One of these is his Natural Cycle Cooling System.

The ice pond behind Kutters Cheese is a practical application of Taylor's technology. With the help of a three-horsepower pump, hoses suspended above the pond spray water into the freezing air. Ice crystals and excess water fall into the pond, a watertight reservoir, and the water is piped through the factory to provide cooling. The ice is stockpiled in the pond, and when the weather rises above freezing, the stockpile is protected from rapid melting by an insulating cover. The melting ice provides a cooling source until freezing weather returns.

"We are producing ice at

ten cents a ton," says Tony Kutter, one of the factory's owners, who notes that if they were using a conventional cooling system, the same ice would cost them three dollars a ton. "And," he continues, "we're doing it without polluting the environment."

According to Taylor, ice ponds are feasible in any area that experiences 500 hours of freezing temperature a year. That's a lot of territory: three quarters of the United States, all of Canada and the Soviet Union, most of Europe, and parts of Asia. Among the many practical applications for the technology is desalinization of water.

"Insecurity over adequate supplies of clean water is emerging as the number-one natural resource problem—not just in the United States but worldwide," says Taylor. A test facility on Long Island is using the ice pond technology to produce potable water at low cost.

Taylor opted for ice over nukes when he became convinced of the power/weapons connection. "All nuclear power systems contain the materials needed for making nuclear weapons," he says. The man who once designed a Mars-bound spaceship powered by 2,000 exploding nuclear bombs should know.

—Wanda Fischer Knoer

ROCK 'N' ROLL WITH AN ECOLOGY PITCH

"Mercy, mercy me!" lamented Marvin Gaye, his consciousness elevated by a rude encounter with the mid-'70s e-col-o-gy. Until now that's been one of the few things anyone in Top 40 music had to say about the environmental crisis.

Greenpeace, a new album from A&M Records featuring 16 tracks from as many performers, adds several songs to the repertoire, and with them a socially conscious benefit: All royalties go to Greenpeace, the organization that for 15 years has done much to raise our environmental awareness.

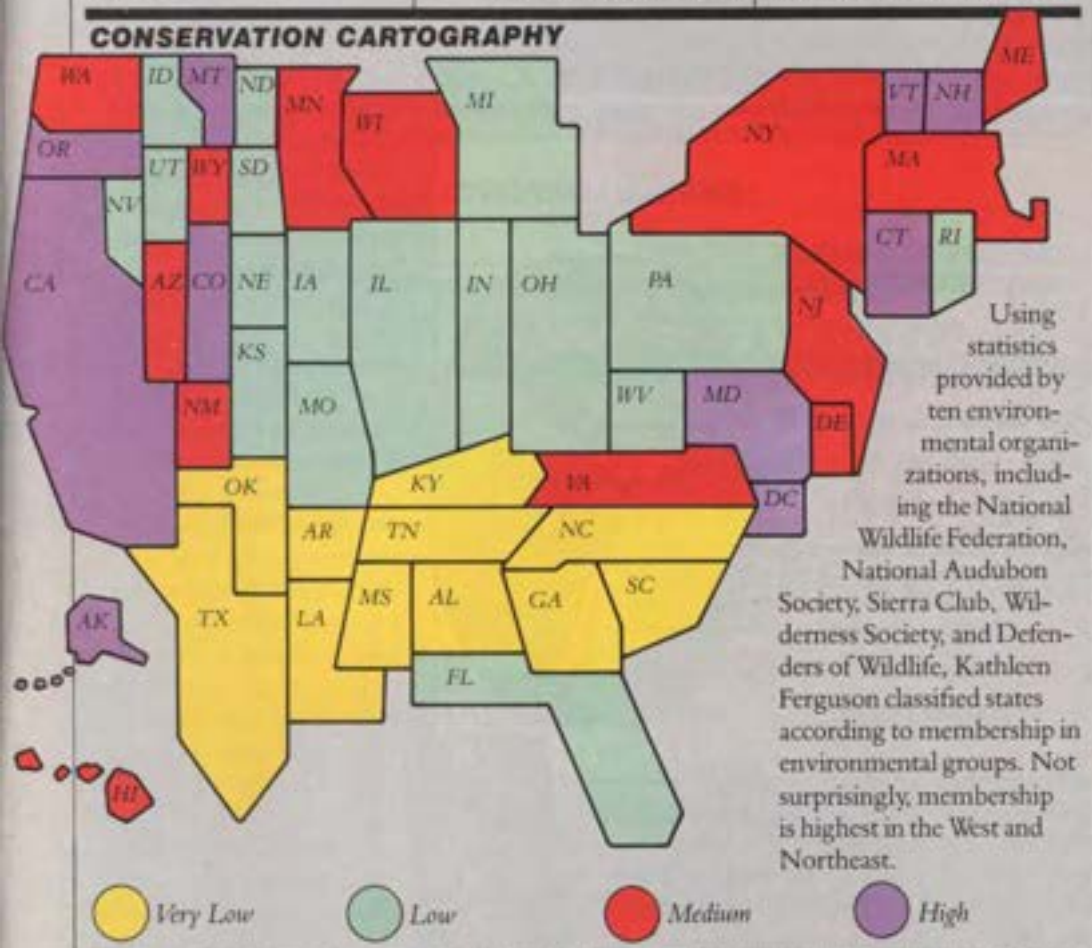
Perhaps the most pointed contribution to *Greenpeace* is a wry ditty from George Harrison called "Save the World." Another of the few overtly green tracks on the album is Queen's "Is This the World We Created?"

The remaining contributions come from a number of recording company vaults, and address a broad variety of themes . . . to say the least. "Icemen in kryptonite, cavemen on wheels. . ." moans Roger Taylor in "Killing Time." Does that strike you as a hymn to Gaia? And if so, how should one respond to Heaven 17's "Let's All Make a Bomb" or Peter Gabriel's "Shock the Monkey"?

Still, these artists have their hearts in the right place, as yours will be when you buy the album. The music—like the cause—couldn't be more up-to-the-minute.

—Jonathan F. King

CONSERVATION CARTOGRAPHY



Using statistics provided by ten environmental organizations, including the National Wildlife Federation, National Audubon Society, Sierra Club, Wilderness Society, and Defenders of Wildlife, Kathleen Ferguson classified states according to membership in environmental groups. Not surprisingly, membership is highest in the West and Northeast.

Kathleen Ferguson, "Toward a Geography of Environmentalism in the United States." Each state in the map has been graphically distorted to reflect the relative size of its population.

CALLING ALL RADIOSONDES

The National Weather Service is looking for a few good instruments. Twice daily the agency launches approximately 200

Pamela Drucker photo by Ed Cockrell

weather-observing devices called radiosondes from 100 sites in the United States. Carried by balloons to altitudes of 20 miles, the radiosondes measure winds, temperature, and humidity, thus aiding the weather service in forecasting storms, floods, and fair weather. When the balloons burst, the radiosondes float down on parachutes.

The weather service relies on outdoor types to retrieve and mail in the shoebox-size instruments, which are designed to be rebuilt and used. "We have rebuilt 670,000 used radiosondes in the past 40 years, saving a total of $10 million," says Richard E. Hallgren, director of the NWS, adding that until recently about 18,000 radiosondes were returned each year.

"But for reasons we still do not understand, several thousand fewer have been returned in the past several years, and our reservoir of a year's supply is being depleted," says Hallgren.

So next time you see something that looks like a shoebox parachute to Earth, mail it in. You still won't have done anything about the weather, but at least you'll have something different to say about it.—*A.S.*

GRIZZLY DETERRENT

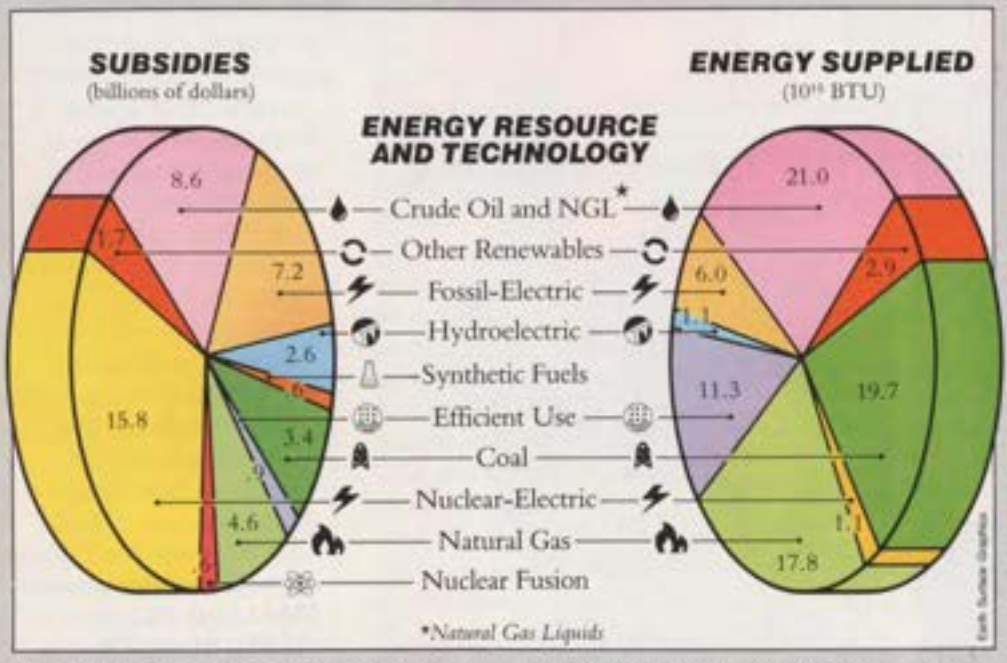
Camping near a quiet mountain lake in Glacier National Park, you are awakened by heavy panting and low growls outside your tent. You peek out and see a grizzly bear, its head nearly the size of your backpack, pawing through your belongings. It turns and comes toward your tent.

Reaching under your pillow you pull out . . . a .44 magnum? No—a can of red pepper. It may take some nerve to face down a griz with nothing but a can of aerosol-propelled red pepper, but recent research indicates that it may be the most effective repellent to a charging bear.

Diana Doan Martinez, who works with University of Montana bear researcher Charles Jonkel, has been testing the spray on bears in captivity. The deterrent is capsicum, the active ingredient in red pepper.

Jonkel and his assistants are looking for ways to restore a fear of people in bears that have lost it. Called "aversive conditioning," the method involves holding bears in cages for a week or two. Twice a day researchers approach the bear; if it charges, they punish it with a spray of capsicum. The hope is that when the bear stops reacting aggressively, it means the animal has learned its lesson and will avoid people when it is returned to the wild.

According to Jonkel, the jury is still out on how well the conditioning works. Of the 15 bears that have gradu-



THE HIDDEN COST OF ENERGY

Federal energy subsidies totaled $44 billion ($523 per household) in 1984. They came in the form of tax breaks, program outlays, loans, and loan guarantees. Nuclear power produced less than 5 percent of U.S. energy, but received $15 billion; renewables produced 9.6 percent of U.S. energy, but received only $1.7 billion.

Source: Center for Renewable Resources

Serious Savings

FOR THE SERIOUS RUNNER!

One year (12 issues)—just $14.97

A savings of $9.03 off the cover price!

FREE Runner's *Training Log!*

PLUS . . . "The RUNNER'S WORLD Training Log"—an 88-page booklet filled with techniques and workout programs along with space to record your training "stats" like time, heart rate, weather conditions, and more—yours FREE!

36C27

NAME

ADDRESS APT. #

CITY STATE ZIP

Send no money now. We'll gladly bill you later.

RW120 In Canada add $3.00. Other foreign add $8.00. Allow 6–8 weeks for delivery.

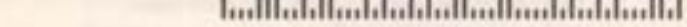
RUNNER'S WORLD—
the one for the road!

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 37 EMMAUS, PA

POSTAGE WILL BE PAID BY ADDRESSEE

Runner's World.
Emmaus, PA 18099-0055



Runner's World®

THE ONE *FOR THE ROAD!*

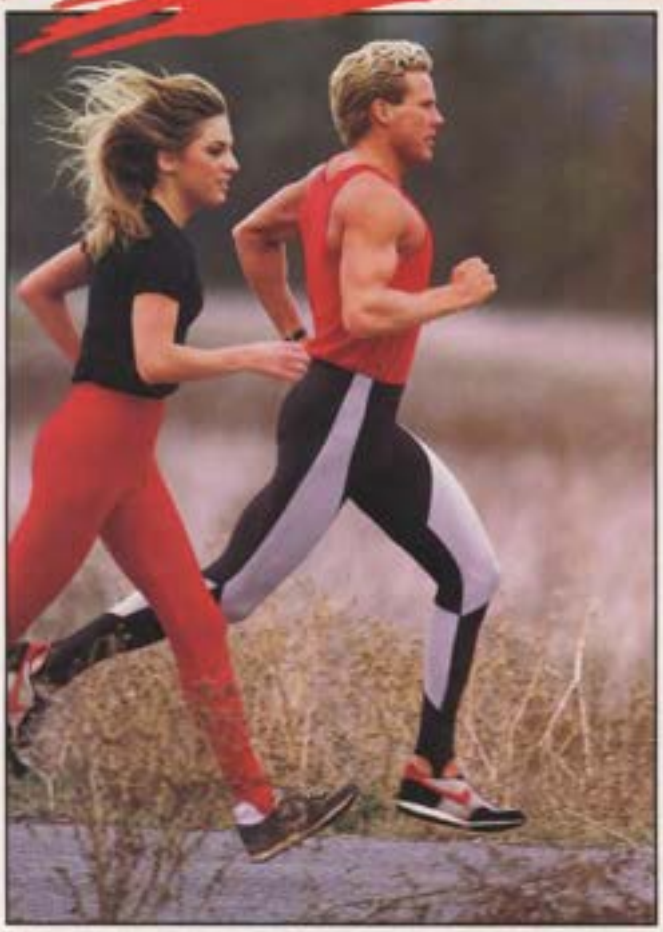
Whether you're looking to run a sub-40-minute 10-K, or simply to increase your monthly mileage, RUNNER'S WORLD will have you *running smarter* with the right equipment . . . tested training tips . . . and advice that'll keep you healthy and ready for the road.

RUNNER'S WORLD helps bring out the best runner in you in terms of speed . . . stamina . . . and staying away from injuries.

So step out from the pack! Get the competitive "edge" each and every month in RUNNER'S WORLD.

TECHNIQUE Ten over-rated rules of running . . . making the most of your training time . . . building upper body strength . . . how to improve your running form . . . preparing mentally for competition . . . how to run safely in the heat . . . strategies for speed . . . how to increase your stamina . . . and more!

STAYING HEALTHY How to prevent and treat blisters . . . advice on leg cramps, chronic fatique and dehydration . . . rebounding from serious injuries . . . the best fluid replacements . . . how orthotics can help your running . . . when to use heat or ice for injuries . . . and more!



EQUIPMENT The best and latest in watches and pulse-meters . . . off-the-road training equipment . . . annual shoe survey: how to get the best shoe for your money . . . cold and wet weather gear . . . and more!

PLUS . . . Common myths of sports nutrition . . . updates on world-class runners and their secrets of success . . . high-energy diets . . . racing news from all over the world . . . regional events . . . how to eat for top performance . . . cross-training tips . . . and lots more!

FREE GIFT!

"The RUNNER'S WORLD Training Log"—An 88-page booklet filled with training techniques, workout schedules, pre-running exercise . . . plus space to record your own training efforts—your time, heart rate, intensity, weather, how you feel, and more!

And, best of all, it's yours free just for entering a no-risk subscription to RUNNER'S WORLD. Send for your free copy today!

SAVE 38%!

☐ **YES!** Please send my free "RUNNER'S WORLD Training Log" and enter a no-risk, one-year (12 issues) subscription to RUNNER'S WORLD at the low price of just $14.97 (a savings of $9.03 off the cover price). If not completely satisfied, I'll cancel and owe nothing. The first issue and booklet are mine to keep regardless.

36C19

NAME _____

ADDRESS _____ APT.# _____

CITY _____

STATE _____ ZIP _____

In Canada add $3.00. Other foreign add $8.00. Allow 6–8 weeks for delivery.

Clip and mail to

RUNNER'S WORLD, Emmaus, PA 18049

ated from the program, including three grizzlies, all but two have steered clear of humans.

The scientific community is not in agreement on the usefulness of a boot camp for bears. Chris Servheen, coordinator of the U.S. Fish and Wildlife Service Grizzly Bear Recovery Team in Missoula, Mont., does not believe conditioning will work

Pamela Drucker; photo by Dr. Caldwell

in the wild. Once a bear has been corrupted, he says, it is usually too late.

Conflicts between people and bears have become a serious problem in Wyoming, Idaho, and Montana, especially around the national parks. As the bears' habitat shrinks and more people take to the backcountry, the number of conflicts increases. In recent years there have been nine fatal bear maulings in and near Yellowstone and Glacier, the only two parks in the Lower 48 with grizzlies.

Capsicum is not the only aversive conditioning agent that's been tried on bears. They've also been bombarded with ultrasonic noise, pressurized boat horns, skunk odor, shark repellent, Mace, and instantly inflating balloons, including one that was shaped like a dog.

But the most effective repellent so far is the capsicum. Once inhaled, it irritates the throat and nasal membranes and takes away the breath, much like tear gas. "It ties up their senses," Jonkel says. "They have to deal with that rather than coming for you." A small company in Arlee, Mont., is marketing the spray under the brand name Animal Repel. A six-inch canister costs $20.

In addition to the efficacy of the procedure, questions have been raised about whether conditioning bears takes something out of a wilderness experience. According to Martinez, "Some people are saying, 'Who wants a kiss-ass grizzly? When you're out in the woods you want one that's going to attack and kill you.' But with so many conflicts," she counters, "it's a question of whether you want a live bear or a dead one."—*Jim Robbins*

PERENNIAL PURPLE PEST ON THE LOOSE

A fisherman making a trip to Wisconsin's Wolf River last summer was horrified to find that the pretty wildflowers growing along the bank were purple loosestrife, a European import that is becoming a menace across much of America.

Loosestrife (*Lythrum salicaria*) has elbowed its way onto wetlands, lake shores, and riverbanks from the East Coast to the Great

James P. Rowan - Click / Chicago

Lakes. A tough, perennial wildflower with dense roots, loosestrife chokes waterways and throttles vegetation that supports muskrats, deer, aquatic birds, and songbirds.

In addition to threatening several endangered species, loosestrife evokes strong emotions from its human observers. "There's no redeeming value to the plant from any standpoint," says Eugene Woehler of Wisconsin's Purple Loosestrife Research Project.

Eradication of loosestrife is difficult because the herbicides that destroy it may pollute waterways and kill valued plants. Many landowners are burning the plant in its late-summer seed stage to keep it from spreading. One promising solution being studied is changing the plant's genetic structure to render the species sterile.

Loosestrife *is* pretty, with purple to red flowers that look like benign plants such as fireweed, blue vervain, or blazing star. Probably imported from northern Europe about a hundred years ago, loosestrife soon became popular with landscapers, florists, and gardeners. One Michigan community even sponsors an annual loosestrife festival.

But its appearance is deceiving. "It's a botanical carp," says Woehler. Like the infamous fish that was imported from Germany a century ago and took over many waterways, loosestrife showed its ugly side only when it got, er, loose.

—*Larry Van Goethem*

DIGGING YOSEMITE

Yosemite Valley. A fur-cloaked, long-haired man hunches over a freshly killed bighorn sheep. He deftly separates the animal's hide from its flesh with a sharp stone blade.

Yosemite Valley, hundreds of years later. An archaeolo-

John Barnes

3 BOOKS, 3 BUCKS. NO COMMITMENT. NO KIDDING.

GARRISON KEILLOR

455. The Great Thoughts
Compiled by George Seldes
Foreword by Henry Steele Commager
QPB: $9.95

731. King Remembered
Flip Schulke and Penelope McPhee
Hardcover: $18.95 **QPB: $6.50**

367. Less Than Zero
Bret Easton Ellis
Hardcover: $15.95 **QPB Ed: $7.95**

100. The Best of Modern Humor
Edited by Mordecai Richler
Hardcover: $17.95 **QPB Ed: $9.95**

567. Final Cut: Dreams and Disaster in the Making of Heaven's Gate. Steven Bach
Hardcover: $19.95 **QPB Ed: $9.95**

378. Son of the Morning Star
Custer and the Little Bighorn.
Evan S. Connell
Hardcover: $20 **QPB: $7.95**

347. This Old House: Restoring, Rehabilitating, and Renovating an Older House. Bob Vila with Jane Davison
Hardcover: $22.50 **QPB: $14.50**

424. Crampton Hodnet
Barbara Pym
Hardcover: $14.95 **QPB Ed: $7.95**

371. Total Recall: How to Boost Your Memory Power.
Joan Minninger, Ph.D.
Hardcover: $15.95 **QPB Ed: $7.95**

518. The Last Place on Earth
Roland Huntford. **QPB: $8.95**
(First published as "Scott and Amundsen.")

366. The Rise and Fall of the Third Reich. William L. Shirer
Hardcover: $24.95 **QPB: $13.95**

611. Mathematics and the Search for Knowledge. Morris Kline
Hardcover: $19.95 **QPB Ed: $9.95**

326. Valley of the Far Side
Gary Larson. **QPB: $5.95**

303. The Twilight Zone: The Original Stories. Edited by Martin Harry Greenberg, Richard Matheson and Charles G. Waugh. **QPB: $6.50**

670. The World of Pooh and **The World of Christopher Robin**
(2 Vols.) A. A. Milne
QPB: $11.95

Try QPB. You'll find a wealth of reading to choose from at very affordable prices. QPB books are softcover editions in hardcover sizes, durably bound and printed on fine paper. But they cost up to 65% less than their hardcover counterparts. More books, fewer bucks. Join QPB.

516. Yeager: An Autobiography
General Chuck Yeager and
Leo Janos
Hardcover: $17.95 **QPB Ed: $9.50**

386. Oxford Bible Atlas (Third Edition). Edited by Herbert G. May
Hardcover: $18.95 **QPB: $8.95**

179. Calvino Set: *If on a Winter's Night a Traveler/Invisible Cities/ The Baron in the Trees.* (3 Vols., Boxed) Italo Calvino. **QPB Ed: $10.95**

309. The House of the Spirits
Isabel Allende
Hardcover: $17.95 **QPB Ed: $8.95**

613. The Tassajara Recipe Book: Favorites of the Guest Season. Edward Espe Brown.
QPB: $7.95

602. Lake Wobegon Days
Garrison Keillor
Hardcover: $17.95 **QPB Ed: $9.50**

Compare

Hardcover: $17.95 **QPB Softcover: $9.50**

618. Iacocca: An Autobiography
Lee Iacocca with William Novak
Hardcover: $19.95 **QPB Ed: $9.95**

631. The Cider House Rules
John Irving
Hardcover: $18.95 **QPB Ed: $9.95**

617. The Flamingo's Smile
Reflection in Natural History. Stephen Jay Gould
Hardcover: $17.95 **QPB Ed: $9.95**

169. One Writer's Beginnings
Eudora Welty
Hardcover: $10 **QPB Ed: $5.95**

107. Marshall Loeb's 1986 Money Guide. Marshall Loeb
Hardcover: $24.95 **QPB: $10.95**

440. War. Gwynne Dyer
Hardcover: $17.95 **QPB Ed: $9.95**

171. The Discoverers
Daniel J. Boorstin
Hardcover: $25 **QPB: $7.95**

434. Ten Philosophical Mistakes
Mortimer J. Adler
Hardcover: $12.95 **QPB Ed: $6.95**

218. The Concise Columbia Encyclopedia
Hardcover: $29.95 **QPB: $12.95**

JOHN IRVING

Join now. Pick any 3 books or sets for $1 each–with no obligation to buy another book.

How membership works.
1. You receive the **QPB Review** 15 times each year (about every 3½ weeks). Each issue reviews a new **Selection,** plus scores of Alternates.
2. If you want the **Selection** do nothing. It will be shipped to you automatically. If you want one or more Alternate books—or no book at all—indicate your decision on the Reply Form always enclosed and return it by the date specified.
3. **Bonus books for Bonus Points.** For each softcover book or set you take (except for the books in this offer), you earn Bonus Points which entitle you to choose any of our softcover books. You pay only shipping and handling charges.
4. **Return privilege.** If the *QPB Review* is delayed and you receive the **Selection** without having had 10 days to notify us, you may return it for credit at our expense.
5. **Cancellations.** You may cancel membership at any time by notifying QPB. We may cancel your membership if you elect not to buy and pay for at least one book in any six-month period.

Let's try each other for 6 months.

Quality Paperback Book Club,® Camp Hill, PA 17012. Please enroll me in QPB and send the 3 choices I've listed below, billing me only $1 each, plus shipping and handling charges. I understand that I am not required to buy another book. You will send me the *QPB Review* (if my account is in good standing) for six months. If I have not bought and paid for at least one book in any six-month period, you may cancel my membership. A shipping and handling charge is added to each shipment.

Indicate by number the 3 books or sets you want. ☐ ☐ ☐

Name _____ 6-16
(Please print clearly) QB437-3

Address _____ **Apt.** _____

City _____ **State** _____ **Zip** _____

Prices generally higher in Canada.

QPB®

The first book club for smart people who aren't rich.

gist crouches in a tiny shelter formed by huge granite boulders. She has made an extraordinary find: a sharp stone blade.

While visitors explore the wonders of Yosemite present, teams of scientists are busy unearthing the wonders of the park past. Their task is yielding rich rewards: Although less than 5 percent of Yosemite's total area has been surveyed, some 700 prehistoric sites have already been uncovered. (The Archaeology Protection Act protects public lands from indiscriminate digging.)


John Senser

Dr. James Bennyhoff, who conducted pioneering archaeological work in Yosemite in 1956, found evidence to support three phases of habitation: a recent phase, the Mariposa Complex; a transitional Tamarack Complex; and a very old Crane Flat Complex.

Recent fieldwork upholds his three-phase model. Surface and topsoil finds include bedrock mortars and pestles, rock shelters, pictographs, clamshell beads, and small, light projectile points. These are all typical of the Mariposa Complex, dated from 1200 to 1800. The artifacts suggest that the bow and arrow was widely used and that acorns were the staple food. Inhabitants were probably the Sierra Miwok and Eastern Sierra Mono Paiute, the two groups still in Yosemite when gold-seekers came upon the valley in the 19th century.

At one to two meters below the surface, excavators have found some artifacts they estimate to be 3,500 years old from the two earlier phases. Larger projectile points and metates, or milling stones, are typical of these older eras. A hand-sized stone, the mano, was used on the metate to grind small seeds and pine nuts into flour. It is still unknown whether these spear-throwing people were ancestral Miwok and Paiute or of totally different origin.

"Not too many years ago we assumed that California civilization was quite young, but now we know that people have been here for several thousand years," says park archaeologist Scott Carpenter. "Because Yosemite is so pristine, it is a perfect place to conduct this work. If park visitors help by recognizing that these sites are a nonrenewable resource, we should be able to piece together the puzzle of California's prehistory."

—John Senser

Pamela Drucker; photo by Gil Caldwell

VIETNAM'S DISAPPEARING FORESTLANDS

After 30 years of war, Vietnam has half the forests it once had. As a result of herbicide spraying, bombing, and clearing, less than 23 percent of the nation is covered with forest, compared to 44 percent in 1943. All this has left a third of the country capable of little or no productivity.

Source: International Union for the Conservation of Nature and Natural Resources, World Wildlife Fund

A BAD CASE OF HIVES

Beekeeping has lost much of its sweetness for commercial producers lately. Low-priced foreign honey, the U.S. debut of "killer bees," and local shortages of nectar in areas of monoculture farming have all posed a challenge to U.S. beekeepers.

Nevertheless, last spring Idaho beekeeper John VanDerWalker was optimistic. "We had the strongest hives ever," he said. "The first of June, I was looking for a new car."

Now, as another spring approaches, a new car is the furthest thing from his mind. Instead of record honey yields, VanDerWalker ended up with record losses last year, losses he attributes to the U.S. Department of Agriculture's grasshopper control program. He is one of 20 Idaho beekeepers who are now suing the USDA.

The trouble started when a dry, early spring gave rise to a bumper crop of grasshoppers. To protect local crops, the USDA respond-

FIELD NOTES

"At a certain point you say to the woods, to the sea, to the mountains, the world, Now I am ready. Now I will stop and be wholly attentive. You empty yourself and wait, listening. After a time you hear it: there is nothing there. There is nothing but those things only, those created objects, discrete, growing or holding, or swaying, being rained on or raining, held, flooding or ebbing, standing, or spread. You feel the world's word as a tension, a hum, a single chorused note everywhere the same. This is it: this hum is the silence. Nature does utter a peep—just this one. The birds and insects, the meadows and swamps and rivers and stones and mountains and clouds: they all do it; they all don't do it. There is a vibrancy to the silence, a suppression, as if someone were gagging the world. But you wait, you give your life's length to listening, and nothing happens. The ice rolls up, the ice rolls back, and still that single note obtains. The tension, or lack of it, is intolerable. The silence is not actually suppression; instead, it is all there is."

—from *Teaching a Stone to Talk.*

The price of looking it up just went *way down!*

While most unabridged dictionaries sell for unabridged prices— $50, $60, $70—this 2,300-page Webster's costs only $19.95. Through a special arrangement with the publisher, we are now able to offer this $69.95 value at a 70%—or $50—markdown from the original price! Now, you can bring this widely respected reference into your home, office, or classroom. And just look at what the Webster's contains:

- Over 320,000 Words
- More than 3,000 Illustrations
- 19 Encyclopedic Supplements
- A Thumb-Indexed Format

This Standard Reference Has Over 320,000 Words

For more than 40 years, the Webster's comprehensiveness has made it *the* standard reference. With over 320,000 words and phrases, the *Webster's New Universal Unabridged Dictionary* continues that great tradition. The Webster's defines common and obscure words, words used in other centuries and words newly created in the sciences and the humanities.

More Than 3,000 Illustrations

GIANT PANDA (6 ft. long)

The Webster's is strong on visuals, too. Finely detailed pen drawings appear throughout the text, and there's a full section of color-plate illustrations of plants, animals, airplanes, ships, and more. These illustrations help make the Webster's a fun, visually exciting learning experience, especially for children.

19 Encyclopedic Supplements

Other dictionaries may contain a few supplements, but the Webster's has over *150 pages* of specialized information for every interest. Here are just *some* of the categories and features included.

- 9 Large, Full-Color Maps
- Dictionaries of Place Names and Geographical Features
- A Dictionary of Biography
- Dictionaries of Names from the Bible, Myths, and Fiction
- A Dictionary of Commonly Used Abbreviations
- Forms of Addresses
- The Basics of Practical Math
- Commonly Used Financial and Commercial Terms
- A Dictionary of Foreign Words and Phrases

A Tradition of Quality

Concise, correct, complete definitions have been the hallmark of the Webster's since the distinguished philologist Noah Webster published the first edition in 1806. The Webster tradition of quality also extends to its format and organization. The pages are thumb-indexed for handy reference. While other large dictionaries use eye-straining type, the Webster's features good-sized print, with defined words standing out clearly in boldface. To make reading easier still, each definition is listed on a separate line or set of lines.

We Repeat: $19.95 Is An Unbeatable Value

An *unabridged* dictionary that sells for $19.95 is a rare find, especially when the dictionary bears a famous name like Webster's. And, as with anything you buy by mail from us, our **30-day money-back guarantee** means that if you decide to return this dictionary within 30 days, we will refund your money *in full*.

SINCE 1873
Barnes & Noble
BOOKSTORES
Dept. W264, 126 Fifth Ave., N.Y. NY 10011

1189398. Please rush me_____copies of the *Webster's New Universal Unabridged Dictionary* at your special sale price of $19.95 (plus $3.00 shipping & insurance). *N.Y. and N.J. residents: Please add sales tax.*

Name _____

Address _____

City _____

State _____ Zip _____

FOR FASTEST SERVICE
Credit Card Customers Call
Toll Free -24 hour 7 days a week
1-800-228-3535
In Nebraska 1-800-642-9606

Check One
☐ Payment enclosed
☐ I prefer to charge this purchase to:

☐ American Express Card ☐ VISA ☐ MasterCard

Account # _____ Exp.

Signature _____

The Re-invention of the Hiking Boot.

Genesis

In the beginning, there was the army boot. Leather, flat-soled and shiny enough to blind a platoon sergeant. It fought the hills but, too often, your feet were the biggest casualty.

Then came the hiking boot. More leather. Thicker soles. Not bad if you dropped rocks on your feet or kicked car doors. But they weighed as much as your pack.

For years hulky footwear was the symbol of conquering mountains. A hiker's mettle was judged as often by the poundage of his boots as by the altitude of the peak.

Along came the lug sole. For the first time weight was reduced. High carbon rubber soles were put on leather uppers and suddenly boots offered wear with less weight.

The Creation

In 1978, a company called Hi-Tec glued a lug sole to a canvas hightop. The result was the re-invention of the hiking boot.

Today our boots have the weight of a running shoe

with the wear of a solid lug sole. Hi-Tec utilizes many innovative materials in our boots, such as Cambrelle* linings and Thermolite* thin insulation. Our technology gives hikers comfort with durability, long wear and style.

And that's more than just a promise. We have many styles. And fashions. Like the Lady Nouveau. Lightweight trail boots that are also very good looking.

The next time you buy hiking boots get lightweights. And choose the lightweights with the technological edge: Hi-Tec. The company that re-invented the hiking boot.

The Star

The Pacific Crest Trail is Hi-Tec's most technically advanced boot. The PCT is made of tough double-mesh nylon and suede with a high carbon outsole, long lasting EVA wedge, steel shank and rear foot motion control stabilizer. The PCT offers sheer comfort and durability. Plus it's very light.

HI-TEC

4500 North Star Way, Modesto, CA 95356.
Sugg. retail: $29.95 to $49.95.

① Double mesh reinforced nylon
② Thermoplastic heel and toe counters
③ Texon' mid sole board
④ High carbon outsole ⑤ Steel shank
⑥ Dual density EVA midsole wedge
⑦ Removable EVA insole
⑧ Rear foot motion control stabilizer
⑨ Padded tongue
⑩ Self adjusting lacing system

THERMOLITE®

ed in a big way: the agency sent DC-3 and DC-4 bombers, among other planes, to rain pesticides over almost 6.5 million acres of Idaho land.

"We wanted to cooperate," says VanDerWalker. "If the hoppers ate everything, we wouldn't have any honey." But the government had no time to cooperate with the beekeepers, according to Larry C. Walker, an attorney who has filed claims for $1.5 million in damages on behalf of 15 beekeepers.

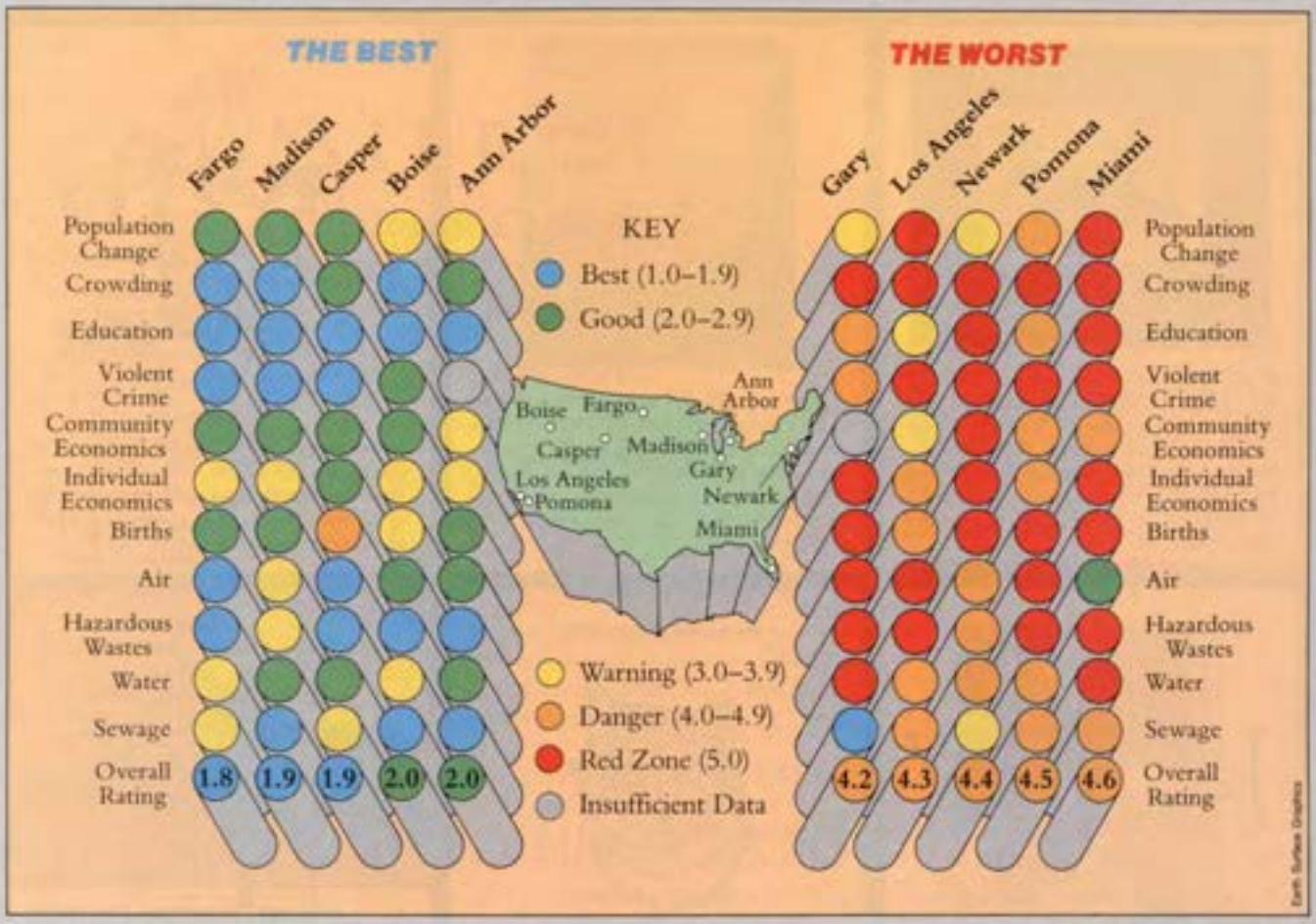
The program started in June, when, with grasshoppers maturing apace, officials had to make up for lost time. Honeybees, key pollinators in modern agriculture, became casualties in the rush program that followed, says Walker.

Some bees were ambushed by drifting malathion and Sevin-4 oil. Others were assaulted directly when pilots sprayed the wrong areas or when beekeepers were not notified in time to move their bees. One beekeeper lost all 1,300 of his hives to an off-target sprayer.

Even beekeepers whose colonies escaped direct damage ended up losers. Their yields averaged 15 pounds per hive, compared to 120 pounds per hive in other parts of the state. On one occasion VanDerWalker and his partner worked all night to move their hives from an area targeted for spraying the next day, only to wait two weeks for the planes to arrive.

So little honey was produced last summer that just keeping the bees alive through the winter is depleting VanDerWalker's honey stockpile. "The only thing I'm praying for is that there are no grasshoppers this year," he says.

—Kathryn Holmes



THE BEST AND WORST AMERICAN CITIES

Zero Population Growth's Urban Stress Test ranked 184 U.S. cities by area, 1982 population, and the number of people per square mile. The group then evaluated each city according to changes in population between 1970 and 1982, housing availability, educational levels, violent crime, community and individual economics, birth rate, air and water quality, the presence of hazardous wastes, and sewage-treatment facilities. The complete list of 184 cities is available by sending a self-addressed, stamped envelope to Zero Population Growth, 1600 Connecticut Ave., N.W., Washington, DC 20009.

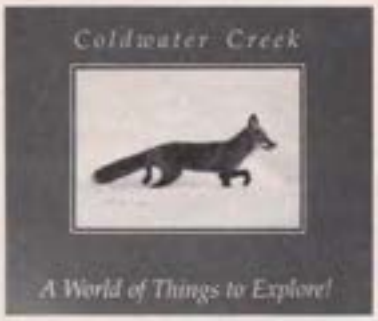
CATALOG of

1. Banana Republic. The official magazine of our imaginary republic contains not only information on our functional, versatile, natural-fabric travel and safari clothing, but also travel tales and trivia, clothing reviews by distinguished critics, unique and soulful artwork. Catalog subscription **$1.**

2. Save up to 80% on hardcover books, current paperbacks, records & tapes, plus exclusive offers from Barnes & Noble—"the world's largest bookstore." Your satisfaction guaranteed. Send **$1.** (Offer valid only in the continental U.S.)

Blue Puma
CLOTHING FOR WATERSPORTS

3. Blue Puma specializes in designing functional, comfortable, and attractive watersports clothing. Our color catalog features specially designed garments to keep the wind and water out. We offer waterproof tops and bottoms, Gore-Tex rainwear, and functional, comfortable nylon pile. Whatever your interest—sea kayaking, canoeing, windsurfing, sailing, rafting, or whitewater kayaking—there is a Blu Puma garment tailor-made to your needs. **Free.**



4. Put a little nature in your mailbox! Find the best in birdfeeders. Binoculars. The tools you'll need for tracking the moon and stars. Wildflowers. Windchimes. Nature prints. Northwest art, jewelry, and more. It's all in one unique color catalog—"A World of Things to Explore!" A year's subscription, **$1.**

5. Just out: Country Cycling Tours' FREE color catalog. 150 marvelous bike trips for adults and families. Discover the countryside in eastern U.S., Europe, Israel, China, and now Guadeloupe. Great accommodations—no roughing it! Our tenth year. **Free.**

6. Deva handcrafts a unique collection of elegant simple clothes—all of lushly textured cotton. We fashion all our styles with an eye toward versatility, comfort, and value. Catalog and fabric samples are **$1.**

J.CREW
OUTFITTERS

7. For men and women who take their weekend wardrobe as seriously as their business attire. The J. Crew collection of sweatsuits, sweaters, trousers, skirts, shirts, shoes, and more. All designed to uncompromising quality standards, in materials chosen for their comfort and endurance. And mostly our own make, thus most advantageously priced. Year's subscription, just **$2** (applied to first order).

JIM MORRIS T-SHIRTS

8. Beautiful art with information about endangered species and environmental issues. Hand silk-screened on 100% cotton T-shirts, $9.45 each. Designs include tiger, wolf/eagle, coral reef, panda, koala, grizzly bear, dolphin/whale, and more. **Free.**

LINDAL CEDAR HOMES

9. Beauty, energy efficiency, and design freedom. That's why we're a cut above in every detail. Send **$7** to Lindal Cedar Homes and get two idea books filled with color photos and over 90 different plans. Write or call toll free and use MasterCard or VISA. 1-800-426-0536.

Sierra makes shopping easy for you. Simply fill out the order card adjacent to this page. Mail with your payment to Sierra Magazine, Reader Service Management Department. P.O. Box 375, Dalton, MA 01227-0375.

SIERRA

Catalog of Catalogs

Please circle the number of the catalogs you wish to receive.

1. Banana Republic. $1
2. Barnes & Noble. $1
3. Blue Puma. Free
4. Coldwater Creek. $1
5. Country Cycling Tours. Free
6. Deva. $1
7. J. Crew Outfitters. $2
8. Jim Morris T-Shirts. Free
9. Lindal Cedar Homes. $7
10. Mainland Cycling Tours. Free
11. Nature Company. $1
12. Neiman-Marcus. $5
13. Old Town Canoe. Free
14. Perception. Free
15. Ramblers Holidays. $1.50
16. Redwood Records. Free
17. United Communications. $1
18. Wildwater Designs. Free

Total cost of catalogs ordered $_____

Handling (Add $1.00) $ 1.00

Total Enclosed $_____

Send check or money order made payable to *Sierra* Magazine and reply card to:

Sierra Magazine,
Reader Service Management
Department,
P.O. Box 375
Dalton, MA 01227-0375

Name _____

Address _____

City _____ State _____ Zip _____

Offer expires May 31, 1986 CAT/86

HOW TO ORDER CATALOGUES

To receive a catalogue from an advertiser listed on this card, circle the appropriate number on the reverse side and enclose your check or money order payable to *Sierra*. Orders without the handling fee of $1 cannot be processed. Don't forget your name and address. Allow six to eight weeks for delivery.

Mail the reply card and your remittance in an envelope to:

Sierra Magazine
Reader Service Management Department
P. O. Box 375
Dalton, Massachusetts 01227-0375

CATALOGS

MAINLAND
CYCLING TOURS

10. Cruise-cycle tours, Maine to Florida. Accommodations on American Cruise Lines' ships for port-of-call bicycle tours or at mainland inns for inn-to-inn bicycle tours. **Free.**

THE NATURE COMPANY

11. The catalog of gifts, prints, sculpture, books, optics, tools, and activities, all inspired by the natural world, representing the best from the Nature Company's California stores. Two issues annually with products for all ages. **$1.**

Neiman-Marcus

12. Spring 1986! Get a taste of the unexpected with this exclusive offer from Neiman-Marcus. Receive a sampler collection of our breathtaking new spring fashion catalogs. Automatically reserve your copy of the dazzling 1986 Christmas Book for delivery by mid-October. Order your subscription now for only **$5**, applicable toward your first credit-card purchase by phone or mail from the catalogs.

Old Town Canoe
MANUFACTURED BY OLD TOWN CANOE CO. OLD TOWN, MAINE, U.S.A.

13. Old Town Canoe catalog offers 35 models. Carefree new multipurpose Discovery model for pleasure paddling, fishing, hunting. Rugged Royalex® canoes for wilderness trips and whitewater. Sleek fiberglass designs for cruising and racing. Classic wood canoes, too. **Free.**

14. Running rivers in a Perception kayak becomes more popular every year. Find out why. Listen as paddlers from all walks of life tell why they love the sport. See the world's most popular kayaks in sizzling, full-color action. Six great kayaks. Dozens of accessories. **Free.**

RAMBLERS
HOLIDAYS

15. Fifty-two color pages featuring around 100 holidays in Britain, Europe, and the Himalayas for the rambler, climber, and outdoor type. Some sightseeing trips, too. Small convivial parties with leader; unpretentious hotels or mountain huts; many trips take you off the beaten track to places you'd otherwise never find. 40th year. Catalog **$1.50**, airmailed from the U.K.

REDWOOD RECORDS

16. Sounds of Our Time from Redwood Records. Expanded catalog of new releases! New Song from Nicaragua produced by Jackson Browne. Feminist, New Age, R&B, and more! **Free.**

UNITED COMMUNICATIONS
research publications

17. A wide variety of beautifully detailed posters. Average size 24" × 31". Ecology charts from the British Museum, N.Y. Botanical Garden, Wildflowers, Game Animals, Wildlife, Herb and Ailment Cross Reference Chart, Dinosaurs, many others. **$1.**

18. Serious equipment for serious paddlers. Products like the Bonnie Hot Pogie® and HiFloat® PFD. Names like Blue Puma, Extrasport, Perception, Voyageurs, and Yakima. Guaranteed satisfaction. Fast service. **Free.**

ENDANGERED SPECIES

Death Among the Lowlife

While pandas, eagles, and whales get the lion's share of public attention, less lovable species are in serious trouble too.

Chip Clark

Robin A. Cochran

New Mexico Department of Game and Fish

If endangered species such as the Kentucky cave shrimp (top) and the tiny Socorro isopod are to survive, their threatened habitats (above left, Nevada's Ash Meadows) must be preserved.

Kathryn Holmes

DEEP IN THE subterranean streams of Mammoth Cave National Park lives the Kentucky cave shrimp. Found only in this place, the troglodyte has dispensed with functional eyes and pigmentation in order to carve out a low-energy existence on scraps of decaying vegetation and bat guano. With none of the romantic fanfare that surrounds the demise of the whooping crane or the Florida panther, the cave shrimp is now dying out, another victim of groundwater pollution and human disturbance.

Although efforts are under way to correct the imbalance, the endangered species list gives short shrift to nature's backboneless creatures. Although the diversity of plants, invertebrates, and cold-blooded vertebrates is much greater than that of warm-blooded vertebrates, more than half the species on the list are birds or mammals.

It's not that cold-blooded and spineless creatures are somehow less susceptible to extinction, says ecologist Elliot Norse, public affairs director at the Ecological Society. Rather, as in George Orwell's *Animal Farm*, "all animals are equal, but some are more equal than others." And with the exception of the attention-getting butterflies and cacti, the species that are "more equal" are those most closely related to *Homo sapiens*.

By and large, invertebrates are discriminated against, says Norse, because "it's harder to muster support for something squishy or crawly than for something like a hawk or large cat." Also, less is known about the status of invertebrates, which include insects, spiders, mollusks, and crustaceans. There simply aren't enough biologists to study even a fraction of the many millions that exist. After recent discoveries in the canopies of tropical rainforests, some biologists believe there may be more than 20 million insect species alone.

In the continental United States, some low-profile species are passing from the scene even before they are given scientific names, much less any sort of protection. Particularly in sensitive ecosystems like islands, deserts, caves, and rivers, the diversity of life is dwindling.

"The species that get in trouble tend to specialize in some very small corner of the world," says George Drewry, a U.S. Fish and Wildlife Service (FWS) biologist. An extreme example is the Socorro isopod, a pillbug-size crustacean that exists only in a rusty pipe connected to a warm spring in New Mexico that was its home before the spring was capped. "A cupful of Clorox would destroy the entire species," notes another FWS biologist.

Some of the narrowly distributed endangered species are remnants of earlier times. Many western fish, for example,

became isolated in small springs and creeks as ice-age waters receded some 10,000 to 20,000 years ago. Fish like the endangered desert dace—which tolerates water at 100 degrees Fahrenheit and has evolved a special scraping apparatus on its jaw for eating algae—are adept at making do with very little, but may not survive the effects of water diversions and the introduction of exotic fish.

"Insects typically are not at all flexible," says Drewry. "They have very narrow requirements that *must* be met. A bug may eat one and only one kind of plant." Where plants like orchids are pollinated by particular insects, the dependency goes both ways.

For species whose lives are so finely tuned to a specific world, habitat preservation is crucial. When a unique natural area is preserved, a cluster of rare life forms is given a chance for survival. The recent establishment of Ash Meadows National Wildlife Refuge in Nevada gave a new lease on life to four species of fish, seven kinds of plants, one insect, and a dozen types of snails found nowhere else in the world.

In the Southeast, dam building has been the bane of two dozen endangered clam species as well as many kinds of fish. The disappearance of fast-flowing waters and the siltation that follows damming are reducing the productivity of the most diverse clam beds in the world. Biologists suspect the clams' failure to reproduce is linked to the decline of fish that carry immature clams in their gills during one phase of the mollusks' life cycle.

In defense of creatures with limited public appeal, one would like to be able to show that each and every organism is indispensable. And there are shining examples of seemingly insignificant life forms that have proven to be lifesavers: The first antibiotic, penicillin, came from a mold; the heart treatment digitalis comes from the foxglove; and remedies for herpes were developed from sponges. Wild relatives bolster the hardiness of major crops, while entirely new species hold promise for domestication. Today we depend on pollinating insects to put apples, squashes, almonds, pears, and cucumbers on the table; tomorrow we may enlist the help of predatory wasps from the tropics to combat field pests.

Ecologists point out that whenever we lose a species, however obscure, our options for using wild allies in the future become narrower. In the case of most invertebrates, "We don't know what they do and what they're good for, but we can't conclude that they're not important," says Martha Stout, a specialist in endangered species.

From an ecological viewpoint, the cumulative loss of tiny, buggy organisms is a serious concern. After all, it is the so-called lower life forms that perform most of nature's essential grunt work, from processing raw materials into food to the enormous task of global waste disposal.

It is hard to conceive of any earth-shattering consequences resulting from the loss of the Socorro isopod. But the real question is, how many minor components can we lose before we lose the entire system?

***Kathryn Holmes** is completing a master's degree in journalism at the University of Minnesota. She reports on rural affairs for the* Grand Island Independent *in Nebraska.*

ENERGY

Setting the Record Straight

Utility companies are spending millions to persuade you that nuclear power is safe. The truth is another matter.

Melanie Griffin

THE MUSIC IS MILD and upbeat. In the background, a beautiful sun; in the foreground, electrical wires. "Electricity from the sun," the announcer says to the television audience. "Scientists are working hard to make solar energy feasible for large-scale use in generating electricity. American utilities alone have spent tens of millions of dollars on solar research and development—yet the government projects that by the year 2000, less than 1 percent of our electrical needs will be

Utility-industry advertisements that proclaim the safety of nuclear-waste disposal methods are being countered by the Washington-based Safe Energy Communication Council.

supplied by solar energy. Coal will supply 53 percent, and nuclear more than 20 percent. Most people aren't aware of that," the voice concludes. "That's why we brought you this message." Across the bottom of the screen appears the credit "U.S. Committee for Energy Awareness."

A similar ad begins with an ominous background hum as the camera zooms in on two nuclear cooling towers. "This year the nuclear industry is spending millions to sell you on nuclear power," the announcer says. "Let's look at the facts. Conservation and solar energy have saved consumers hard-earned dollars in homes and factories across the country, and have put Americans back to work. Dollar for dollar, these investments make a lot more sense than nuclear power. And the benefits go directly to you—not the nuclear industry." The tagline declares, "Nuclear power creates waste . . . Conservation creates jobs." The ad is sponsored by the Safe Energy Communication Council.

Not surprisingly, this battle for the hearts and minds of the American public is being waged by two quite distinct

adversaries. The U.S. Committee for Energy Awareness (CEA) was formed in 1979 by representatives of the nuclear industry. Its goal, according to CEA documents, was systematically to dispel "public misconceptions and negative attitudes" regarding nuclear power. Motivated by the belief that public trepidation about nuclear energy is the result of "deliberate mischief and misinformation," the organization has set about combatting this "festering problem."

With the help of a number of public-relations firms, advertising agencies, and professional pollsters, the CEA has for several years been engaged in a $25-million-per-year campaign to "set the record straight." National networks broadcast subtly crafted pro-nuclear television ads into American homes, and most major magazines and newspapers across the country run the CEA's artsy one- and two-page color ads.

The committee trains and places pro-nuclear speakers on radio and TV talk shows, conducts direct-mail campaigns, and lobbies major media outlets in an effort to encourage positive nuclear news coverage and opinion columns. At the local level the CEA has produced videotapes for use in public schools and civic group meetings, and has recently organized "citizens' panels" to educate the public in states that are potential dump sites for high-level waste. The message is always the same: Nuclear power is safe, practical, and necessary for a healthy economy.

Facing off with the CEA in this battle is the Safe Energy Communication Council (SECC), a coalition of 15 national environmental, safe-energy, and public-interest media organizations. The SECC was formed in late 1980 specifically to counter the efforts of the CEA. Working with a $100,000 budget (.4 percent of the CEA's), the council is responding to the nuclear industry's campaign. "The CEA is no benign educational organization," says SECC Director Scott Denman. "It is a high-powered, high-financed strategic propaganda thrust by an industry in trouble."

Much of the SECC's work consists of informing people about what it considers inaccuracies—or at least omissions—in the CEA ads. One television spot, for example, tells people that scientists have developed procedures they believe can safely dispose of nuclear waste. The scientist narrating the ad says "the method is to permanently seal off the waste from our environment and store it deep in stable geologic formations."

"Through the use of poorly written, ambiguous language, the CEA's nuclear waste ad leads the viewer to believe that the waste problem has in fact been solved," says James J. MacKenzie, a senior staff scientist with the Union of Concerned Scientists. MacKenzie wrote a critique of the CEA ads for the SECC.

"To state that 'the method' is to seal wastes away does little more than articulate a goal that is currently far from being achieved," he says. "The stark facts are that no proven means of safe disposal have been demonstrated; no high-level nuclear waste has ever been disposed of permanently; many of the technical and scientific problems of waste disposal are just beginning to be addressed; and even by the most optimistic estimates, no facility for permanently disposing of wastes would be available before the 1990s."

By stressing the relatively small vol-

ume of radionuclides in high-level waste, the CEA ads also belie the toxicity of the material. One ad claims that after several thousand years the radioactivity of high-level waste "drops to the level of natural uranium ore." Another ad claims this takes only a thousand years. In fact, the National Academy of Sciences estimates that it will take 3 million years for spent fuel to decay to the same level as the uranium ore from which it was produced.

In conjunction with these claims about the safety of nuclear power, the CEA tends to underestimate seriously or completely ignore improvements in new energy technologies. Renewable technologies such as solar and wind power are said to be "still too expensive for widespread practical use," although some are already making significant contributions to the nation's electricity supply.

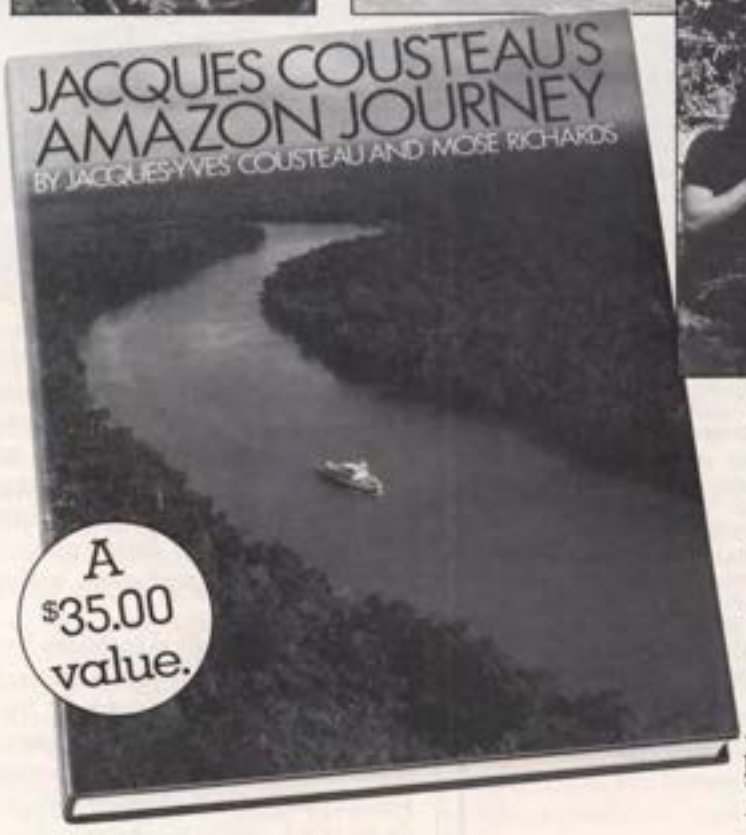
In addition to a national media outreach program designed to balance the CEA ads, the SECC conducts grassroots training and organizing across the country. The council helps local safe-energy groups monitor industry ads, build coalitions, and use the press effectively.

One of the group's greatest successes, according to Director Denman, has been "making the CEA campaign itself the issue." Significant attention has been brought to bear on the issue of funding, and when it became public that the committee encouraged its member utilities to pass the cost of its campaign on to ratepayers, the CEA came under fire.

Facing ever-rising utility bills, consumer groups protested bitterly to state regulatory commissions, and utilities were called upon to justify their actions. As a result, many utilities have been denied the right to pass on the cost of their CEA contribution.

The SECC's major weapon in its financially lopsided battle has been the federal "Fairness Doctrine," which requires licensed broadcasters to give balanced coverage to controversial issues of public importance. The SECC provides local groups with technical advice and expert training in the application of the doctrine.

Under the SECC's guidance, citizens' groups have obtained about $775,000 worth of free radio and TV air time in



"Brilliant photographs show the curiosities of the Amazon."

—*N.Y. Times*

TAKE JACQUES COUSTEAU'S AMAZON JOURNEY for only 99¢!

when you join the
Natural Science Book Club.
You simply agree to buy 3 more books—at handsome discounts —within the next 12 months.

"With stunning photographs, this is fine fare for any armchair traveler and an excellent supplement to the PBS-TV series."

—Publishers Weekly

"Three teams of photographers and scientists crisscrossed the interior wilderness by truck, airplane, helicopter; by riverboat, hovercraft, raft and kayak. Mose Richards of *Calypso Log* recounts the logistics of the journey and follows the separate expeditions; his narrative combines with Cousteau's personal journal for an exciting story of travel and adventure.

"In addition to studying the region's natural history, the teams visited large-scale development projects in Brazil, sources of the international drug trade in Colombia and Peru and beleaguered Indian tribes in Brazil, Peru and Ecuador."

—Publisher's Weekly

The Natural Science Book Club is a unique book club devoted to bringing you exciting, refreshingly different books on all areas of the natural sciences. From the life story of early man to the death of the solar system... all the wonders of the natural world are revealed to members of the Natural Science Book Club.

MEMBERSHIP BENEFITS • In addition to getting Jacques Cousteau's Amazon Journey for only 99¢ when you join, you keep saving substantially on the books you buy. • Also, you will immediately become eligible to participate in our Bonus Book Plan, with savings of up to 70% off the publishers' prices. • At 3–4 week intervals (16 times per year), you will receive the Natural Science Book Club News, describing the coming Main Selection and Alternate Selections, together with a dated reply card. • If you want the Main Selection, do nothing, and it will be sent to you automatically. • If you prefer another selection, or no book at all, simply indicate your choice on the card and return it by the date specified. • You will have at least 10 days to decide. If, because of late mail delivery of the News, you should receive a book you do not want, we guarantee return postage.

Natural Science Book Club
Riverside, New Jersey 08075

Please accept my application for trial membership and send me Jacques Cousteau's Amazon Journey (56966) billing me only 99¢ plus shipping and handling. I agree to purchase at least three additional Selections or Alternates over the next 12 months. Savings range up to 30% and occasionally even more. My membership is cancelable any time after I buy these three additional books. A shipping and handling charge is added to all shipments.

No-Risk Guarantee: If I am not satisfied—for any reason —I may return Jacques Cousteau's Amazon Journey within 10 days. My membership will be canceled, and I will owe nothing.

Name_____

Address_____ Apt.____

City_____

State_____ Zip_____

(Books purchased for professional purposes are a tax-deductible expense. Offer good in Continental U.S. and Canada only. Prices slightly higher in Canada.)

Sierra 3/86 4-6915

response to paid industry ads. "Without the Fairness Doctrine, any group with the funds to buy advertising to advocate a controversial viewpoint could saturate the airwaves," says Jim MacInnes, conservation chair of the Sierra Club's Dacotah Chapter. "With the Safe Energy Communication Council's invaluable expertise, we were successful in raising the Fairness Doctrine issue in South Dakota." Supported by the Dacotah Chapter, the Nuclear Waste Vote Coalition was able to obtain more than $18,500 worth of free radio and TV time, which translates into more than a hundred spots aired statewide.

"In a sense, the SECC has helped revitalize the safe-energy movement," says Denman. "This is the first time that many groups have ever been able to use televison for advertising; as a result they now have the opportunity to reach an entirely new constituency."

The SECC has also produced ads that are available for use by local organizations, and it assists groups in producing their own spots. In response to nationally broadcast CEA ads, safe-energy activists in Michigan negotiated 30 minutes of free air time to show a program on solar-energy opportunities in their state.

Dozens of other local coalitions have voiced their concern about the one-sided CEA ads to broadcasters in their areas. "The networks have been put on notice that part of the national viewing audience objects to the biased propaganda the CEA claims is educational and informative," says Denman.

You may hear a soothing voice on your radio or TV assuring you that, "for billions of years, the Earth has been bathed by radiation from the sun. In fact, more than half our radiation exposure is from nature." But don't be surprised if some time soon, a picture of the sun appears on your TV screen and a different voice tells you, "You're looking at the world's largest nuclear power plant: the sun. It's 93 million miles away—about how far a nuclear plant should be to be safe."

Melanie Griffin edits the Sierra Club's "National News Report" from Washington, D.C., and serves on the executive committee of the Safe Energy Communication Council's board of directors.

Earn Interest On Your Principles

At America's largest socially responsible money fund.

At Working Assets, your savings *won't* finance missiles, toxic wastes or apartheid. You'll like what we *do* invest in.

You'll earn high current interest, compounded daily—plus free check-writing and no withdrawal penalties. IRAs and Visa® cards, too.

WORKING ASSETS

YES! I want my money to work for me and *speak* for me, too. Please rush me your FREE prospectus including more complete information about management fees and expenses. I'll read it carefully before investing. $1,000 minimum.

Name _____

Address _____

City/State/Zip _____

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS, PERMIT NO. 22359, San Francisco, CA

POSTAGE WILL BE PAID BY ADDRESSEE

WORKING ASSETS
MONEY FUND
230 California Street
San Francisco, CA 94111

Sludge Is an Awful Thing to Waste

Hailed by some as a boon to agriculture, the residues of conventional sewage treatment are one more toxic headache.

Judy Licht and Jeff Johnson

TEN YEARS AGO severe water pollution had the economy of Muskegon, Mich., on the ropes. Industrial wastes from chemical plants and a large paper mill—coupled with sewage from the city's population of 40,000—had polluted the region's waters, including Lake Muskegon, once a popular resort area. Tourism was dropping off, and new industries were reluctant to locate in an already highly polluted area.

To answer the problem, Muskegon could have constructed a conventional waste-treatment facility, with all of its drawbacks and limitations. Instead the community elected to build an innovative facility that uses recycled wastewater to irrigate farmland. This year more than 10 billion gallons of wastewater will be used to fertilize some 450,000 bushels of corn, with income from corn sales defraying part of the costs of the land-treatment facility. According to Richard Thomas of the EPA's Innovative Technologies Office, "The result is advanced wastewater treatment at reduced cost."

Land-treatment facilities, like conventional plants, begin with a primary treatment process. In a conventional plant, a series of screens removes large objects ("two-by-fours, bowling balls, and dead bodies," in the words of one sewage activist) and solids. These make up the first "sludge." The leftover wastewater may then be subjected to secondary and possibly "advanced" treatment, depending on the system's sophistication.

At each step more sludge is removed and the wastewater becomes purer. At the same time, however, the sludge becomes more toxic and thus harder to get rid of. Further treatment also increases the amount of "purifying" chemicals added to sludge and wastewater, and those chemicals make it harder to use the nutrients in sewage for agriculture.

One of the nation's most advanced conventional treatment plants is the billion-dollar Blue Plains facility in Washington, D.C.—at least according to District of Columbia officials.

But Blue Plains is a white elephant, according to Marian Agnew, an attorney who has lobbied for the past decade for alternatives to conventional sewage treatment. "The plant is not in synchronicity with nature," she says. "It's big and centralized and run on second-rate technology."

On a recent tour of Blue Plains, a staff engineering technician pointed out problems at the plant that back Agnew's contentions. A long network of pipes was abandoned after three months because of leaks. Taxpayer funds were wasted on a computer system that never worked. "Nothing works exactly the way it was designed," said the engineering technician.

At Muskegon, by contrast, wastewater is held in large lagoons to settle out the solids. Plant nutrients—nitrogen, phosphorus, and potassium—remain in the water, which is then pumped from the lagoon to irrigate woods, agricultural crops, parks, or highway median strips. The flow of wastewater through the soil is the final filtering system, so vegetation and soil are selected according to the contaminants to be removed.

Wastewater cleansed by percolating through this natural filter can be trapped and reused. Muskegon channels its purified wastewater into Lake Muskegon, which is now clear to a depth of 16 feet, where visibility was previously a matter of inches.

Using soil as a natural filter, land treatment uses fewer chemicals to neutralize wastewater and generates less sludge in the holding lagoon than conventional treatment. "Eventually, something must be done about the sludge," says the EPA's Thomas, "but the time frame with land treatment is measured

in 10 to 20 years, not days or weeks."

Land treatment is the wave of the future, says sewage activist Agnew. "These facilities use no energy except for pumping, they allow communities to use water several times, and they can make money for the community."

"In some big cities, the most they have going for them is their sewage, and they don't realize it," says Jack Sheaffer, a sewage expert, author, and one of the principal designers of the Muskegon project. Pollutants are nothing but "resources out of place," he says. In fact, forests irrigated with wastewater have produced five times the normal yield, according to studies conducted at Penn State University.

But land treatment has its drawbacks, too. The reliance on soil as a natural cleansing system makes it especially important that contaminants in wastewater be clearly identified or, better yet, nonexistent. Technically the plants are complicated to design, although they are cheaper to run and maintain than conventional systems. The process requires agronomists, soil scientists, geologists, and irrigation specialists, as well as traditional sanitation engineers. And the systems require large amounts of land and a comprehensive approach to municipal waste treatment.

For land-treatment advocates, these problems are far less insurmountable than those connected with conventional treatment plants. True, the conventional plants built since passage of the Clean Water Act have done much to cleanse the nation's waterways. But they have also generated millions of tons of contaminated sludge, which, like sewage, is a problem that won't go away.

Washington's Blue Plains plant, for example, produces "in the neighborhood of 1,700 tons of sludge a day," according to Francis Riddle, a senior staff engineer. By late 1983, District of Columbia officials were facing a sludge disposal crisis. More than 100,000 tons of the stuff were stockpiled at the facility, and the mounds were growing. To work down the stockpiles, D.C. now pays to have the sludge trucked to sites in Maryland and Virginia.

District officials contend that Blue Plains sludge is adequately treated for land application as fertilizer. But critics

disagree. "This wet sludge is toxic waste," says Erik Jansson, who worked on sewage problems for Friends of the Earth. "Blue Plains is moving sewage to different locations without taking any responsibility."

One of the places the sludge is going is Fauquier County, Va.—vast farm and horse country 60 miles from Blue Plains. The sludge has "totally disrupted the community," Esther Forbes explains. She and her husband Bruce are activists in FORGE (Fauquier Organized Residents Guarding the Environment), a 3,500-member group that opposes sludge dumping. They worry about the content.

"Sludge is an ungodly brew of countless synthetic and natural compounds of unknown structure, properties, and toxicity," according to Donald J. Lisk of the Toxic Chemicals Laboratory at Cornell University. "Municipal sludges contain all the waste products of industrial and domestic users." Typically, 100 to 200 industries may flush wastes into a single treatment plant, meaning literally thousands of chemicals can be present in the plant's sludge. Lisk's list of known sludge contents includes PCBs, insecticides, flame retardants, carcinogenic polynuclear aromatics and nitrosamines, and a host of other chlorinated organic compounds and petroleum oils. Some viruses, such as polio and hepatitis, can survive the chlorination process and have been found in sludge.

But sludge haulers claim it is a natural fertilizer that can produce increased farm yields. Newspaper ads in Virginia placed by a major Blue Plains sludge hauler claim: "50 states and 50,000 farmers can't be wrong. . . . Sludge is perfectly harmless, almost odorless, [and] greatly beneficial to crops." The haulers, paid $30 a ton by the District of Columbia, also give sludge away to farmers. Still, most food processors (Del Monte, Purina, and Quaker Oats among them) will not accept food grown with sludge. The food companies are following guidelines developed by the National Food Processors Association (NFPA), which calls the EPA's guidelines "complex and confusing." The EPA warns that for foods grown on sludge-treated lands "the federal government cannot offer any indemnity against product recalls, seizures, or other enforcement action."

There are also serious questions about the agricultural use of compost generated from sludge. Boston has just initiated a pilot composting plan to handle 3

Wastewater treated at this innovative plant in Muskegon, Mich., is used to irrigate croplands. Sales of corn produced nearby contribute to the facility's operation.

© Jim Jackson

percent of the 2,500 tons of sludge the city generates daily. But the proposal has many environmentalists worried, primarily because of the odor and the industrial contaminants that work their way from sewer system to sludge to compost. Boston has industrial pretreatment requirements—as mandated by the Clean Water Act—but opponents doubt their efficacy.

"Establishing an adequate monitoring system for 4,000 industrial dischargers in the metro system is like chasing the Holy Grail," says Debby Knight, executive director of Greenpeace's northeast office in Boston. Enforcement consists of spot checks and self-reporting, and "as long as you have those industrial tie-ins you're going to have contaminated sludge. Composting will just recycle the contamination."

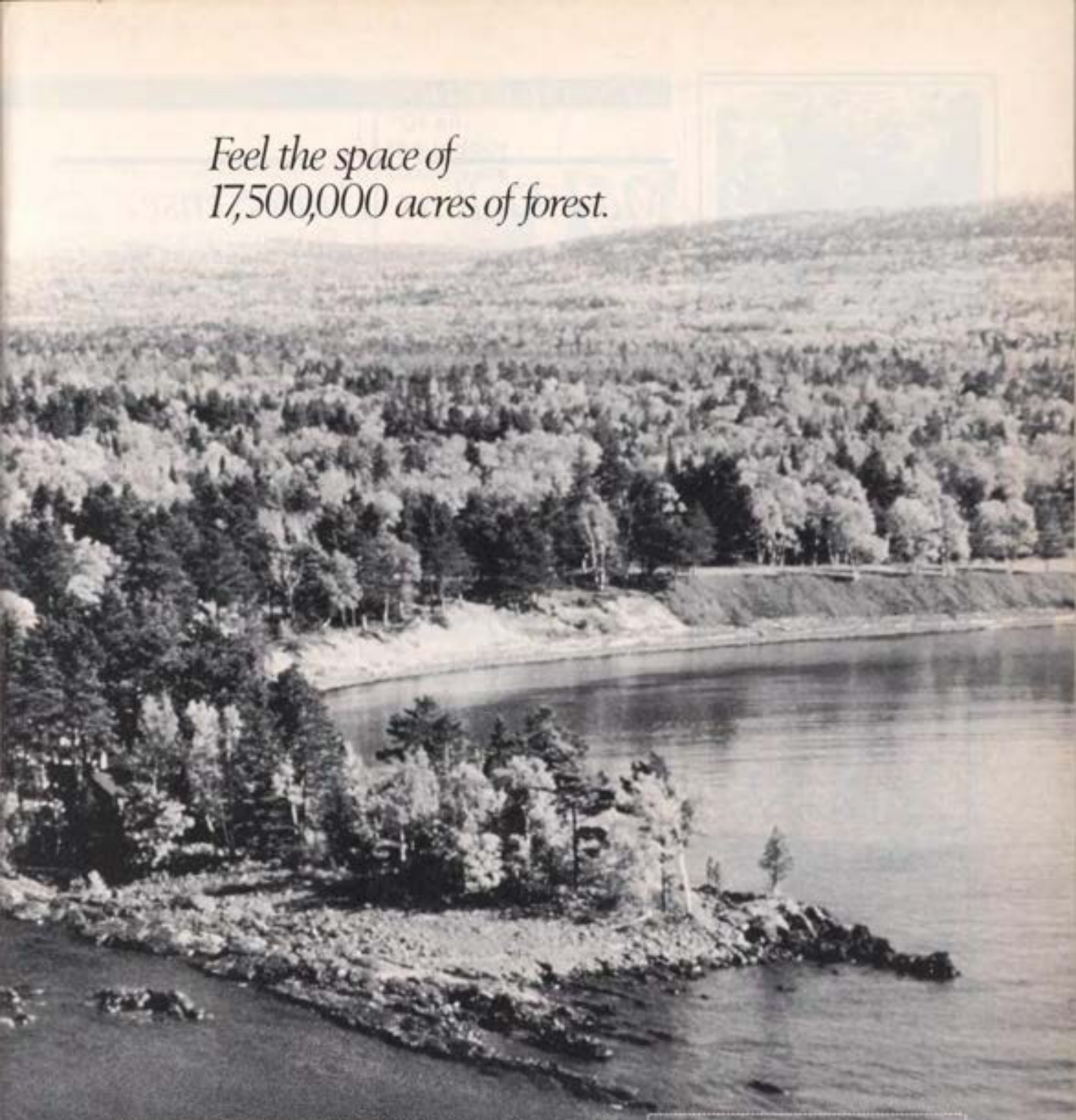
WITH CONVENTIONAL sewage treatment, the cleaner the discharge water, the more contaminated the sludge. And unless environmentally acceptable uses or safe disposal methods are found for this witches' brew, basic changes are needed: Either the contamination must be reduced by eliminating industrial toxics from the sewers, or municipalities must adopt alternative treatment systems.

"We've got to encourage companies to reduce and recycle their wastes," says Greenpeace's Knight. "They can't be allowed to discharge into the oceans, rivers, or the sewers. It is much easier to control toxic waste at the source than after it is dumped into the system."

Crop irrigation and methane production are two of the more common alternative ways to treat and recycle sewage, but a number of other ideas—producing bricks from sewage, for instance—are being batted about. Whichever technology (or combination of them) proves the most effective alternative to conventional sewage treatment, the fact remains that Americans flush away 6.8 billion gallons of sewage every day. It's a resource we can no longer afford to send down the drain. ■

Judy Licht *is a writer based in Washington, D.C.;* ***Jeff Johnson*** *is an editor at* Environmental Action. *An expanded version of this article appeared in the September/October 1985 issue of that publication.*

Feel the space of 17,500,000 acres of forest.



Find your space in the shade of Michigan's 17,500,000 acres of forest, and your place in the sun along the world's longest fresh-water shore.

You'll feel the most open welcome a camper can find in the nation. Michigan has more than 70,000 public and private campsites. No other state has so many. We accommodate campers in more than 70 state parks and three national parks. No other state does so much.

Settle in for a spell in the unspoiled wilderness surrounding a wondrous waterfall, or in the shadow of a stand of virgin white pines, or in the midst of a vast stretch of high and mighty dunes. Just passing through won't do. Nor will coming just once. Four full seasons keep the fun as fresh as the water in Michigan and the scene forever new. Come now, and again. The feeling is forever.

For more information on Michigan camping, send this coupon to:
Michigan Travel Bureau, Dept. CSIER
P.O. Box 30226
Lansing, Michigan 48909

*Name*_____

*Address*_____

*City*_____

*State, Zip*_____

*Or call toll free: 1-800-292-2520 (Michigan); 1-800-248-5700 (elsewhere).**

YES M!CH!GAN

* CT, DC, DE, IL, IN, IA, KY, MA, MD, MN, MO, NC, NH, NJ, NY, OH, PA, RI, SD, TN, VT, VA, WV, WI.

POLITICS

More Dollars Than Sense

An executive order signed in 1981 lets the federal Office of Management and Budget, not Congress, decide whether the EPA can enforce any more of its "burdensome" regulations.

Cass Peterson

THE STORY has become something of a legend in its own time. On February 17, 1981, less than a month after President Reagan took his first oath of office, the top attorneys from more than a dozen executive agencies were summoned to the White House for a sneak preview of one of the administration's first presidential orders.

The lawyers casually leafed through the document, jotting down questions and underlining troublesome phrases. It wasn't until they got to the last page that they discovered the exercise was meaningless: The President had already signed the document. Executive Order 12291, the most powerful weapon in the new administration's war against federal regulation, had already been deployed.

With a stroke of his pen, the president who was swept into office on a pledge to "get the government off the backs of the people" had shifted the power of rulemaking from the executive agencies to the Office of Management and Budget (OMB). The order gave the budget arm of the White House unprecedented authority to review agency rules and reject any that did not pass muster under a rigorous cost-benefit analysis.

Five years later, both advocates and critics of the Reagan administration's deregulatory philosophy describe the slender document as a turning point in the battle over regulation. The consequences have been dramatic for rules designed to protect human health and the environment. While the administration referred to the directive as a management tool, critics contend that it has made the OMB into a "super-regulator" that exerts almost full control over thousands of federal regulations.

Since 1981 the OMB has used Executive Order 12291 to delay, alter, or kill dozens of regulations—from workplace safety rules issued by the Occupational Safety and Health Administration (OSHA) to infant-formula nutrition standards set by the Food and Drug Administration. Dozens more have disappeared into what regulatory officials refer to as the "black hole of OMB."

To no one's surprise, the Environmental Protection Agency has been one of the budget office's most frequent targets. When President Reagan promised to "remove the tentacles of excessive regulation that are strangling our economy," there was little doubt that he saw the EPA as the octopus.

Each year the EPA issues hundreds of rules, from major air-quality standards and pesticide approvals to minor changes in wastewater permits. Because virtually all of these rules have some economic impact on industry, it didn't take long for corporations to provide the administration with hit lists of the ones they most wanted to see abolished.

Moreover, while he was a member of Congress, the new budget director, David Stockman, had frequently led attacks against what he considered "excessive" antipollution rules. In his famous "Dunkirk" memorandum to the newly elected president, Stockman singled out pending regulations on carbon monoxide, industrial boiler emissions, hazardous waste, and toxic chemicals as the sort of "burdensome" rules that should be blocked or watered down.

The head of the OMB's regulatory affairs, meanwhile, was James Miller, a conservative economist who shared Stockman's antipathy toward environmental regulation. Back in 1975, when he was a member of the Council on

Wage and Price Stability under President Ford, Miller attacked air-quality rules as "another case of EPA overkill." Later, as a resident scholar at the American Enterprise Institute, Miller cultivated a reputation as a deregulatory guru.

During the first three years of Reagan's first term, Stockman wielded a budgetary axe on the EPA, reducing its purchasing power by more than 40 percent. And for the first two of those years, Miller dove into the regulations—often backed by industry officials.

Resistance to the OMB's decisions was not received kindly. In congressional testimony in 1983, the EPA's former general counsel, John Daniel, recalled that the OMB resorted to threats when the EPA insisted on issuing a rule to regulate industrial water pollutants, citing a court-ordered deadline. Daniel testified that a top OMB official told him "there was a price to pay for what we had done, and we hadn't begun to pay."

According to a congressional committee, the OMB used "tremendous pressure" and "veiled threats" in 1981 to keep both OSHA and the EPA from issuing restrictions on the use of ethylene dibromide, a potent pesticide that federal scientists called the most powerful carcinogen they had ever tested. The substance was eventually banned for most uses, but only after it started turning up in hundreds of food products, prompting a national outcry.

By the end of the administration's third year, the OMB had reviewed 1,074 of the EPA's proposed rules. Thirty-one of them were sent back to the agency; an additional 22 were withdrawn for reworking. Among them were standards for the safe disposal of hazardous waste in landfills, delayed for more than two years and significantly weakened before they finally emerged. Standards to control the temporary underground storage of hazardous wastes were delayed for months, well past a court-ordered deadline. They were finally released when environmentalists filed a lawsuit.

The OMB used its new power like a neighborhood bully, and was proud of it. "When you're the toughest kid on the

block," Miller boasted, "most kids won't pick a fight with you."

Still, the administration's efforts occasionally ran afoul of the judicial system. In one of its first forays against the EPA, the budget office forced the agency to suspend several provisions of a rule requiring industry to clean toxic waste before sending it to municipal sewage-treatment facilities. The suspension was challenged by environmental groups and overturned in federal court after it was disclosed that some industries had made their case privately to the OMB.

There are laws against *ex parte* contacts, the legal term for this kind of back-door dealing. Officials at the OMB dismissed the legal restrictions on the grounds that they "do not apply to informal rulemakings of the kind covered by Executive Order 12291."

But according to Miller, who left the OMB in late 1981 to become chair of the Federal Trade Commission, the administration underestimated the political response to its tactics. "I didn't appreciate fully the need to have this information off the public record," he said in a 1984 interview.

More significant, however, was the fact that many of the OMB's most ambitious deregulatory efforts were being thwarted by the public rule-making process and its inevitable paper trail. Behind every significant rule was a thick file of public documents. The administration's efforts to withdraw or dramatically alter rules that had already been proposed were being overturned in the federal courts on the grounds that the decisions were "arbitrary" and flew in the face of the public record.

As a result, the budget office began turning its attention to new regulations, where it held a more powerful hand. Under Executive Order 12291, proposed rules have to get the go-ahead from the OMB *before* they can be formally initiated. And they must be approved by the agency again before they can become final.

Environmentalists quickly recognized the potential consequences of the new procedure. "It's a secret process that gives the public no opportunity to know an agency's intention or what OMB's influence on it was," an environmental lawyer and former EPA air-quality official said in 1981.

Occasionally, OMB officials didn't even wait for a rule to be forwarded before making their intentions known. In a 1983 memorandum to former EPA Administrator William Ruckelshaus, Christopher DeMuth, then head of the OMB's regulatory affairs office, flatly advised the EPA that it should be willing to tolerate higher risks in new chemicals "without imposing either controls or testing requirements." The memo was aimed at an entire set of rules that the EPA had not even begun to write.

"The OMB has gotten more brazen," says Richard Ayers, an attorney for the Natural Resources Defense Council. "They're more willing to exert their power." To Ayers the greatest mystery is the courts' reluctance to challenge what OMB critics have described as a flagrant circumvention of the laws requiring open government.

Now, however, that apparent judicial reluctance may be changing. On January 29 a federal district judge in Washington, D.C., ruled that the OMB could not delay the issuing of an EPA regulation beyond a deadline set by Congress. Judge Thomas Flannery, responding to a lawsuit brought by the Environmental Defense Fund (EDF) challenging EPA rules for underground storage tanks, called the extension of the OMB's review authority beyond its statutory deadline "incompatible with the will of Congress," ruling that it cannot be sustained as a valid exercise of presidential powers under the Constitution.

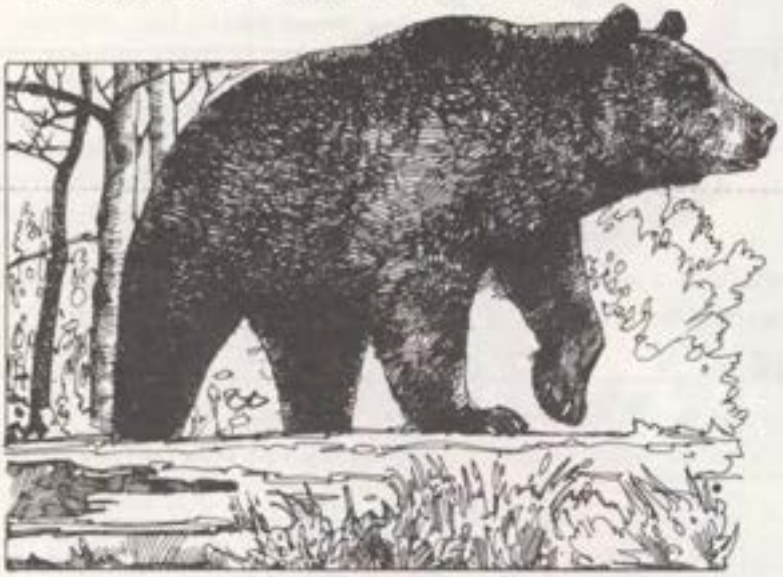
According to EDF attorney Robert Percival, Flannery's ruling "makes it clear that, as a legal matter, OMB cannot do any more than just advise EPA and that EPA is free to accept or reject that advice. Nothing OMB does can slow EPA down."

In recent months members of Congress have voiced increasing concern that the OMB is abusing its authority under the executive order to avoid com-

Nobody Likes To Leave Home.

Since 1892, the Sierra club has been this nation's most consistent and effective defender of wilderness—and those that call it home.

As a Sierra club member, you add your voice, your strength and your financial support to this vital work.



SIERRA CLUB

MEMBERSHIP FORM

☐ Yes, I want to join! Please enter a membership in the category checked below.

New Member Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS: If you are giving this membership as a gift, please enter your name and address below:

Donor Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS will be announced by a special gift card in your name.

MEMBERSHIP CATEGORIES

	Individual	Joint	SPECIAL CATEGORIES	Individual	Joint
Regular	☐ $ 29	☐ $ 33	Senior	☐ $15	☐ $19
Supporting	☐ $ 50	☐ $ 54	Student	☐ $15	☐ $19
Contributing	☐ $100	☐ $104	Spouse of Life		
Life	☐ $750	per person	Member (Annual Dues)	☐ $15	

All dues include subscription to *Sierra* ($6) and chapter publications ($1).

Sierra Club Dept. J-155, P.O. Box 7959, San Francisco, CA 94120

Residents of Canada, please remit in Canadian funds to:
*308 47 Colbourne Street, Toronto, Ontario, M5E 1E3 (Eastern Canada)
P.O. Box 202, Victoria, British Columbia, V8W 1R8 (Western Canada)

MEMBERSHIP FORM

☐ Yes, I want to join! Please enter a membership in the category checked below.

New Member Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS: If you are giving this membership as a gift, please enter your name and address below:

Donor Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS will be announced by a special gift card in your name.

MEMBERSHIP CATEGORIES

	Individual	Joint	SPECIAL CATEGORIES	Individual	Joint
Regular	☐ $ 29	☐ $ 33	Senior	☐ $15	☐ $19
Supporting	☐ $ 50	☐ $ 54	Student	☐ $15	☐ $19
Contributing	☐ $100	☐ $104	Spouse of Life		
Life	☐ $750	per person	Member (Annual Dues)	☐ $15	

All dues include subscription to *Sierra* ($6) and chapter publications ($1).

Sierra Club Dept. J-155, P.O. Box 7959, San Francisco, CA 94120

Residents of Canada, please remit in Canadian funds to:
*308 47 Colbourne Street, Toronto, Ontario, M5E 1E3 (Eastern Canada)
P.O. Box 202, Victoria, British Columbia, V8W 1R8 (Western Canada)

plying with laws that do not coincide with the administration's social or economic policies. For example, EPA drinking-water standards that were to have been reviewed within 60 days were released after six months only when the Senate adopted a measure that would have forced the EPA to publish them without OMB approval. Senator David Durenberger (R-Minn.), who sponsored the measure, said he suspected the OMB was holding the rules while rewriting the government's policy on cancer-causing substances: Several of the EPA's proposed rules involved carcinogens found in drinking water.

In a scathing report last year, a congressional subcommittee headed by Rep. John Dingell (D-Mich.) raised similar questions about the administration's commitment to controlling asbestos, a known carcinogen. After nearly seven years, the EPA produced a set of rules that would have banned many products made of asbestos. The rules were sent to the OMB along with what EPA officials thought was an airtight defense: a detailed cost-benefit analysis showing that the new standards would save much more than they would cost.

But in what the subcommittee report called the "quintessential illustration" of the way the OMB is using its review authority, the budget office first quarreled with the analysis and then forced its own interpretation of the law on the EPA. The rules were first withdrawn and then, finally, released in January 1986—two years later than scheduled.

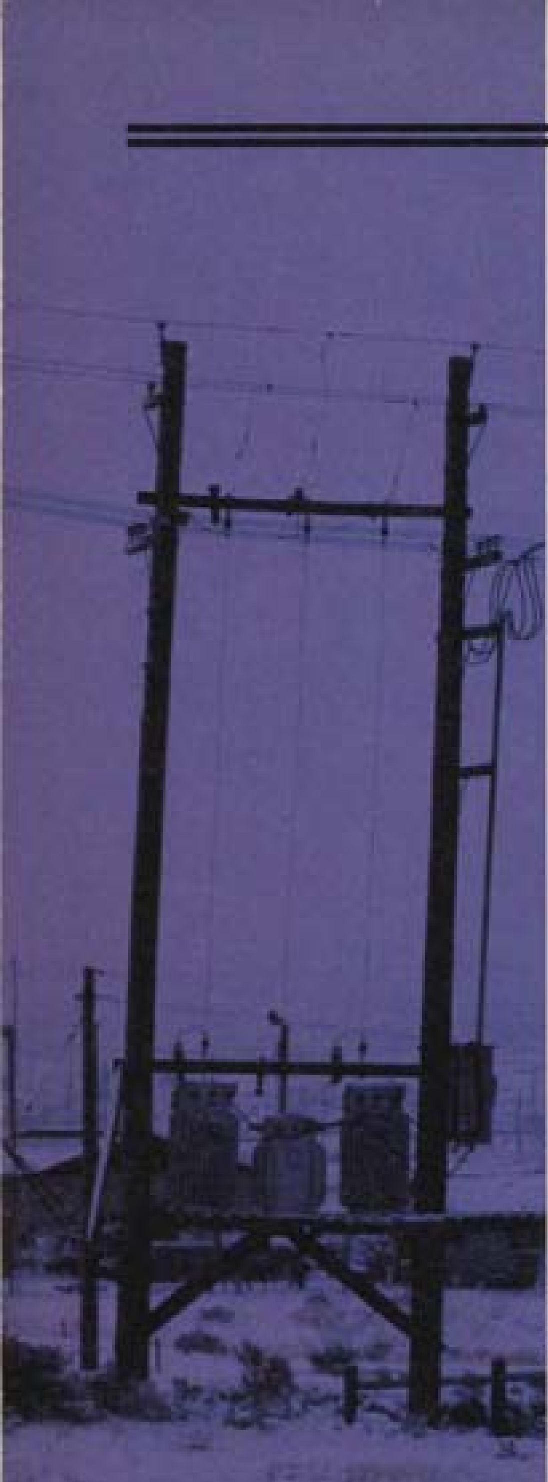
Budget officials deny that they have used the executive order to interfere with regulatory agencies. In a recent legal brief defending the executive order, the Justice Department went even further, suggesting that agency heads are "free to ignore" the review process.

But as Sen. Carl Levin (D-Mich.) said after Judge Flannery's ruling in January, "OMB has been caught with its hand in the cookie jar. The court has affirmed what OMB has steadfastly denied—that its role in reviewing rules under the executive order is more than advisory."

Still, a second executive order (#12489, signed in 1984) will be enforced by none other than James Miller, who returned to the OMB late last year to succeed David Stockman. Miller's presence is widely seen as a sign that the administration intends to give new vigor to its deregulatory agenda.

None softened by his four years as regulator at the Federal Trade Commission, Miller appears eager to resume the crusade. When he was reminded at his confirmation hearing of the Justice Department's position that agencies may bypass his reviewers, Miller responded firmly: "They do so with peril." ■

Cass Peterson *is a staff writer for the* Washington Post.



THE WESTERN BOUNDARY of Yellowstone National Park is easy to spot from the air: It divides the park's forests from the bleak clearcuts outside. The cuts are a graphic example of the federal government's failure to protect borderlands vital to park wildlife. But an even more menacing threat lies underground.

Much of the subsurface along this boundary has been leased for oil and gas exploration and development. Giving little or no thought to the environmental consequences, the U.S. Forest Service and the Bureau of Land Management (BLM) have opened the way for development of a bustling industrial complex next to the oldest and one of the best-loved national parks in the world.

If these leases are developed, park elk, moose, deer, and grizzly bear that rely on habitat outside the park would find oil rigs, roads, and pipelines in their once-secure mountain refuges. According to National Park Service geologists, holes poked by oil and gas drillers just outside the park could also disrupt the delicate underground plumbing that feeds geysers and other thermal features within Yellowstone Park.

Almost no consideration was given to the plight of grizzlies or geysers by the federal agencies that made the decision to sign away development rights to these lands. Although both the Forest Service and the BLM have elaborate land-use planning processes, almost all oil and gas leasing decisions have been made outside of them, with little or no public notice and no detailed environmental review.

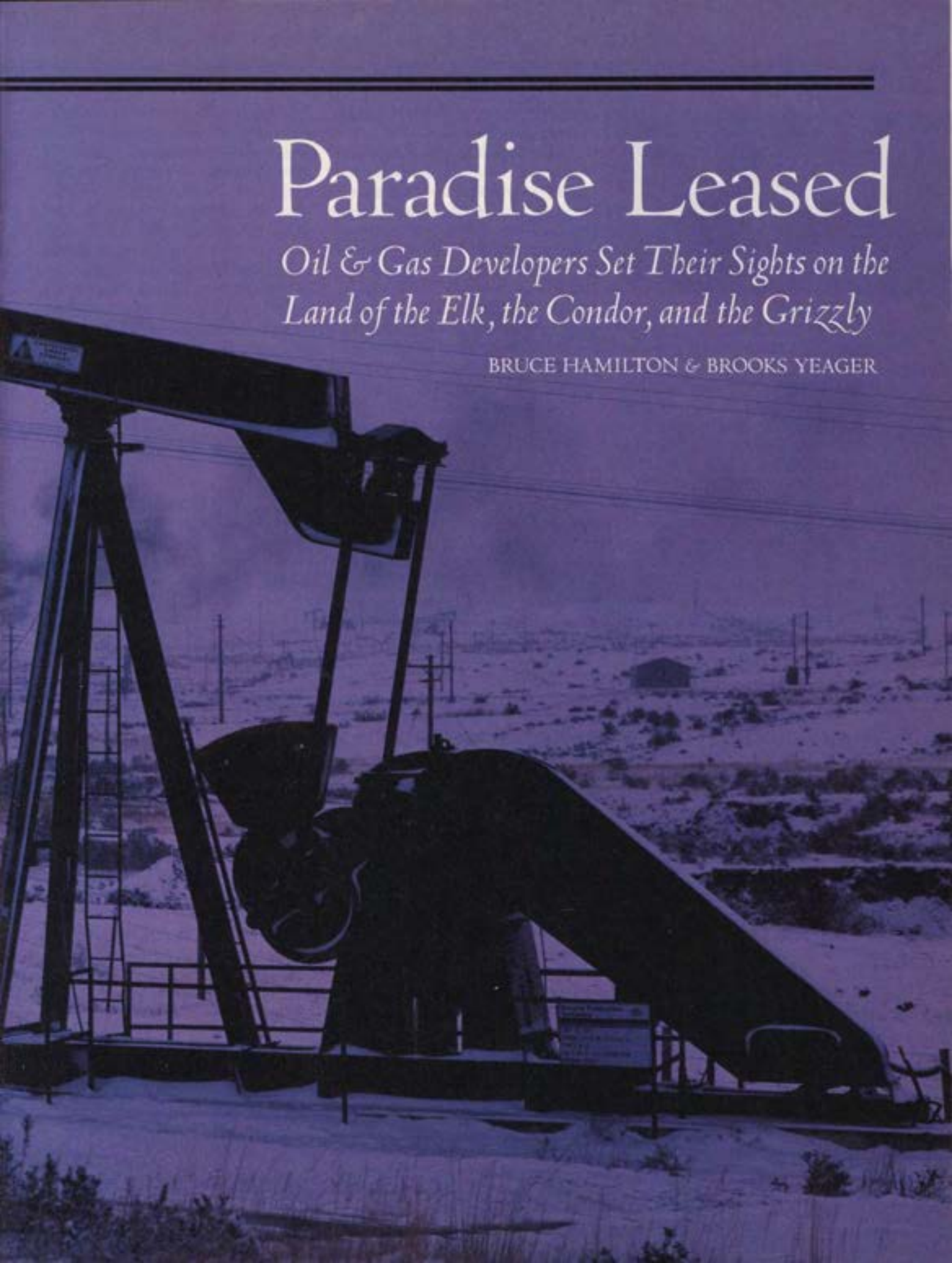
The BLM administers the minerals under most federal lands, including national forests, where it seeks the advice of the Forest Service before leasing. Both agencies generally operate under the assumption that leasing is a mere paper transaction and that development will hardly ever occur. The battle to

The Shoshone National Forest (left), a recent oil and gas industry target.

Paradise Leased

Oil & Gas Developers Set Their Sights on the Land of the Elk, the Condor, and the Grizzly

BRUCE HAMILTON & BROOKS YEAGER



A Yellowstone grizzly bear

ensure that national parks and wilderness areas are off limits to new leasing has been won. But almost all other Forest Service and BLM-administered lands are leased indiscriminately. In states with oil potential, as much as 96 percent of the available federal land is leased or under application.

The National Park Service, state wildlife agencies, and conservationists are caught in the awkward position of pointing out the folly of leasing environmentally sensitive lands after most of the decisions have already been made. They admit the impacts of oil and gas development are less severe than those of most other forms of mineral extraction, and acknowledge that it is hard to predict which lands will be developed. But they object to a leasing process that gambles with the public's natural resources, putting irreplaceable wildlife and scenic values on the line and then dealing the public out of the game. This high-stakes wager ignores the special requirements of environmentally sensitive and highly prized tracts of public land. As a result, national treasures are being blindly leased and lost:

- In the canyonlands of southern Utah and the sand dunes and badlands of Wyoming's Red Desert, the Bureau of Land Management has allowed roads, drill rigs, and bulldozers to scar fragile desert lands that were being considered for wilderness designation. In effect, future wilderness boundaries here are being drawn by bulldozers instead of by Congress.
- In the California Desert Conservation Area east of Los Angeles, the BLM has issued 115 oil and gas leases on tracts it had earlier singled out as "areas of critical environmental concern." The conservation area was set aside by Congress as a showcase for the protection of fragile desert resources.
- In the Los Padres National Forest along the central California coast, the Forest Service and BLM are in the process of issuing hundreds of leases covering thousands of acres. Potential lease sites include several roadless areas under consideration for wilderness designation, a proposed wild river corridor along Sespe Creek, and the spectacular Big Sur coastline. Also proposed for leasing is the Sespe Condor Sanctuary, an area set aside to protect the habitat of the endangered California condor. (See "Too Late for the Condor?" January/February 1986.)
- In the Lewis and Clark National Forest next to Glacier National Park and the Bob Marshall Wilderness, hundreds of thousands of acres of grizzly bear, elk, and bighorn sheep habitat have been leased. Exploration has already begun in several areas, even though much of the forest is under consideration for wilderness protection.

A bighorn ram

MOST OF THE SCANT media attention on the leasing issue has focused on the Greater Yellowstone Ecosystem, an area that includes the park and a large expanse of adjacent acreage that supports park wildlife. Almost 200 exploratory wells have been drilled here, all but five of them dry holes. Conservationists have been trying to prevent damage from individual development projects and, more recently, attempting to eliminate the defects in the oil and gas leasing system that spark these brushfire battles.

Ed Madej, a Sierra Club activist and environmental consultant, paints a grim picture of the situation in Yellowstone. Hired by the Club to conduct a detailed analysis of the oil and gas leasing problem in the six national forests that surround Yellowstone and Grand Teton national parks, Madej found that Forest Service personnel often don't know precisely which national forest lands have been leased. By piecing together information from government files, he found approximately 5.8 million acres of land open for leasing. This figure represents virtually everything outside of designated wilderness areas, amounting to 60 percent of the area's forest land. Of this acreage, about 4.5 million acres are already leased.

Bull elk in rutting season

With so much public land leased or available for leasing, "oil and gas development has the potential of being the single greatest environmental impact to the Greater Yellowstone Ecosystem," says Madej. "Although there has not yet been a major commercial find within the ecosystem, should such a find occur nothing in the current planning would prevent development of a massive production infrastructure right next to Yellowstone Park itself."

Another part of Madej's study examined the agencies' leasing process. When the federal government leases a coal, oil shale, or offshore oil tract, it prepares a detailed environmental impact statement. The National Environmental Policy Act (NEPA) requires these for any federal action that will have a significant impact on the environment.

But when the government leases lands for *onshore* oil and gas development, it often prepares no environmen-

tal review at all—or merely an "environmental assessment." Often only 10 to 20 pages long, these documents are used to analyze the impacts of leasing on hundreds of thousands of acres of public land. Almost every assessment concludes that leasing will have no significant impacts, and that preparation of a more detailed statement is unnecessary. According to the agencies, potential impacts can be dealt with later, if and when site-specific development plans are proposed by industry.

"Unfortunately," says Madej, "under Interior Department policy, the issuance of a lease commits a tract of land to development, so even the best-intentioned land managers may later find that the option of avoiding irreparable damage to a sensitive area has been foreclosed."

The Little Missouri National Grasslands in North Dakota provide a graphic case in point. Until recently these rolling prairies and colorful badlands surrounding Theodore Roosevelt National Park were the wildest part of the Great Plains still in public ownership. Thousands of acres of flowing grassland used to be sole province of the rancher and deer hunter—much the way it was when the Rough Rider himself vacationed here.

Now the Rough Rider has been displaced by oil industry roughnecks. Pump jacks rock back and forth just across the highway from the national park's headquarters. In the last 15 years thousands of acres of wild grassland have been crisscrossed with service roads and utility lines. This once-wild prairie with its ranches and wildlife had the misfortune of being located in the heart of the Williston Basin—one of the hottest onshore oil prospects in the country.

In the early 1970s Custer National Forest planners vowed to preserve the remaining Little Missouri roadless areas even as they encouraged oil development. But once the leases were signed and oil was struck, there was no turning back. An industrial complex sprawled across areas that, according to Forest Service land-use plans, were supposed to remain roadless.

State wildlife managers decried the agency's lack of concern for wildlife on these roadless lands. "It is apparent to us now that the rapid pace of development and the commitment to honor existing leases led to unanticipated and poorly evaluated impacts," said State Game and Fish Department Coordinator Michael McKenna in a 1983 letter to the National Wildlife Federation.

Taking the story of the Little Missouri Grasslands as a grim warning of what could happen to Yellowstone and other cherished wild lands, the Sierra Club has launched a major campaign to force the government to undertake thorough environmental studies and land-use planning before public land is leased for development.

The campaign has met with some success in the courts. The Sierra Club Legal Defense Fund won a major battle for pre-lease planning in May 1981, when a federal appeals court ruled that the Forest Service should either prepare an impact statement prior to leasing or prohibit surface disturbance of the area leased. But the federal agencies refused to apply the decision outside the area at issue—a steep, scenic mountain range called the Palisades that straddles the Idaho-Wyoming border just south of Grand Teton National Park. Elsewhere

Taxpayers Lose in the Oil Lottery

FOR A $75 FILING FEE and an annual rent of a dollar per acre, the government in 1983 leased to speculators 18 tracts of public land in Wyoming directly adjacent to a producing oil and gas field. Within weeks, 12 of the 18 tracts were resold to an oil firm that operated some nearby wells. The leaseholders made more than $100 million in the transaction.

The recent history of the federal leasing program is replete with such blunders: The government leases high-potential tracts through a noncompetitive lottery, only to discover later that they contain extremely valuable oil or gas deposits. Congressional committees and the courts have grown increasingly critical of the financial and administrative side of the government's leasing system, and have frequently forced partial or total suspensions of the lottery.

Under the present system, any tract presumed to contain valuable oil and gas deposits must be leased competitively. But the Bureau of Land Management's method of determining where valuable deposits lie is inadequate, according to a recent U.S. Court of Appeals ruling. The agency lacks a meaningful way to discriminate between valuable and nonvaluable properties, the ruling stated.

The vast majority of tracts—more than 97 percent—are leased noncompetitively. Noncompetitive leases are sold either over the counter (for previously unleased tracts) or through the lottery.

A recent report issued by the House Appropriations Committee accused the Interior Department of losing millions of dollars annually through the lottery, and of allowing private interests to interfere with the supposedly impartial system. Even a better-run lottery would still spawn consumer fraud by unscrupulous lease brokers, who specialize in bilking unwary consumers by promising that they will win valuable properties in the lottery.

Taxpayers and consumers, as well as environmentalists, have a big stake in the efforts to reform the leasing system this year.—*B.Y.*

the Forest Service persisted in its lease-first, worry-later approach.

In 1984 U.S. District Court Judge Paul Hatfield suspended all leases in two national forests in Montana pending completion of adequate pre-lease environmental impact statements. The Montana decision is being appealed by the federal government, the oil industry, and Mountain States Legal Foundation, the law firm headed by James Watt before he became Secretary of Interior. The firm's director told Wyoming's *Casper Star-Tribune* that if the decision is allowed to stand, "oil and gas leasing in national forests as we know it today will be gone."

Conservationists don't go that far—but they do hope the victory will spawn significant reforms in the leasing system. So far, the government's response has been less than encouraging: After each ruling the agencies have tried to satisfy the court regarding the specific site at issue, while leaving the basic leasing process unchanged.

The agencies' reluctance to apply court-mandated reforms broadly has forced conservationists to turn to Congress for relief. The Sierra Club is taking the lead in a congressional campaign designed to establish more precise statutory requirements for pre-lease environmental review. Under the Club's plan, adequate public notice and participation would be required in sensitive leasing decisions, and areas unsuitable for leasing would be identified and removed from consideration. Oil and gas leasing decisions would no longer be made outside the agencies' land-use planning processes. The Forest Service would be given responsibility to lease its own land rather than just advise the BLM, and consultation with other resource agencies, including the National Park Service and state wildlife agencies, would be required.

The time is right for a change. Bills to revamp the financial and administrative side of the onshore oil and gas leasing

The Well That Woke Up Yellowstone's Neighbors

"THIS IS THE BEST big-game country around. That's why I live here," says Don Schmalz, a Wyoming outfitter who lives along the North Fork of the Shoshone River. "In winter you can drive down the road in the early morning or late evening and see 800 elk and a hundred bighorn sheep."

The road from Cody, Wyo., to Yellowstone National Park follows the North Fork of the Shoshone River. To the south is the Washakie Wilderness; to the north, the North Absaroka Wilderness.

Each winter, elk and sheep descend from their summer ranges in the park and neighboring wilderness areas to seek refuge in the North Fork Valley. North Fork side drainages are also a favorite stomping ground for the grizzly bear—a species threatened with extinction in this area.

To wildlife the North Fork is just as crucial to survival as the park or wilderness lands. But there is an important difference between the North Fork Valley and surrounding lands: Most of the valley has been leased for oil and gas development. In the park and wildernesses, leasing is forbidden by law.

Oil development is nothing new to the Cody area. Old, established oil fields lie in the sagebrush-covered hills just east of town. But until recently, hardly any interest had been shown in exploring the rugged national forest lands to the west. Only after the 1973 OPEC oil embargo and the subsequent rise in the price of oil did speculators begin picking up leases in the forest.

Local citizens were not informed about the forest leasing. But even if they had known about it, most of them probably wouldn't have cared. The prevailing attitude was that leasing wasn't harmful; it was just a transaction on paper.

Around 1981 this attitude began to change. Seismic crews started blasting throughout the forest to determine whether oil-bearing strata were likely to lie below. "Those seismic crews had no regard for the country or the wildlife," Schmalz says. "I remember being up on Jim Mountain in the North Fork just before the bighorn sheep were ready to lamb. I watched as the crews started blasting and sending sheep running all along the side of the mountain."

The blasting was a temporary nuisance; as winter settled in, the companies gathered their information and left. But by 1983 the blasting had revealed at least one interesting prospect. Soon the federal government was faced with Marathon Oil Company's application for a permit to drill an exploratory well on a ridge overlooking the North Fork.

Because of the difficult terrain, the steep, unstable soils, and the importance of the wildlife habitat, Marathon offered to commute to the drill site by helicopter during the exploratory phase. If the company struck commercial quantities of oil or gas, however, it expected to be allowed to build roads and utility corridors to service the site.

When local residents and Wyoming conservationists learned of Marathon's proposal, they met with the Forest Service to urge rejection of the application. Seismic blasting had been bad enough, but the specter of an oil or gas field along the North Fork was completely unacceptable.

The Forest Service and the Bureau of Land Management (BLM) dutifully prepared an environmental impact statement on the proposed drilling permit. The agencies concluded that the well "would result in a four-month temporary disturbance, with no long-term adverse environmental

system are now pending in Congress. There is a widespread feeling that the system is "subject to fraud, an invitation to speculation, and financially disastrous for the government," according to Sen. Dale Bumpers (D-Ark.). Dissatisfaction with the government's primary method of leasing—a noncompetitive lottery—has added strength to congressional voices calling for change in other aspects of the system.

As Rep. Morris Udall (D-Ariz.), chair of the House Interior Committee, put it, the present leasing system is "an administrative and environmental nightmare crying out for reform."

Udall's staff members have already included new environmental planning requirements in legislation circulated for review on Capitol Hill. Other key House members, including Public Lands Subcommittee Chair John Seiberling (D-Ohio), have made clear their intention to press for even more stringent reforms.

"The BLM's oil and gas leasing policies make a mockery of the land-use planning processes mandated by law," says Seiberling. "It's clear that the BLM leasing people give little or no consideration to the environmental impacts of their programs. This is serious not only for [BLM] lands but for national forest lands and wildlife refuges as well."

Blind luck and a depressed oil market have delayed the inevitable: a major commercial find of oil or gas within shouting distance of Yellowstone, Glacier, or another national treasure. But the matter can't be left to luck. The federal government has given preferential treatment to the oil and gas industry for too long. For the grizzlies, geysers, canyonlands, and condors—for the protection of thousands of acres of public lands—the nation needs a new leasing system now. ■

***Bruce Hamilton** is the Sierra Club's Director of Conservation Field Services; **Brooks Yeager** is the Club's Washington representative in charge of energy issues.*

consequences *unless* the well goes to production [emphasis added]."

Local sportsmen, landowners, and environmentalists mounted a campaign to block Marathon's proposal. They argued that oil and gas development was incompatible with the North Fork's fragile environment. But the agencies were unresponsive. They said that under existing laws they did not have the authority to deny the application on environmental grounds. The message was all too clear: Once the lease was issued, it conveyed a legal right to develop the land and build roads and utilities. If local citizens and state agencies didn't want development, they should have voiced their concerns when the leases were being considered. Now it was too late.

Marathon Oil's controversial North Fork well site.

Jack Richard Photo Studio

So why didn't North Fork citizens speak up before the leases were issued? They didn't have a chance. The responsible Forest Service official apparently saw no problem with the application and recommended routine approval to the BLM. Neither agency consulted the public or took a hard look at the consequences before agreeing to lease.

The only pre-lease review was a 1979 environmental assessment in the Forest Service's Rocky Mountain Region. It ignored site-specific problems and concluded that leasing would have no significant environmental effect. The cursory 15-page document gave the green light to leasing more than 17.4 million acres of national forest lands, including the entire North Fork Valley and 900,000 acres of the Shoshone National Forest.

When the citizens of the North Fork found out how the decision had been made to commit this spectacular wild valley to oil development, they went to court. But U.S. District Court Judge Clarence Brimmer sided with the government. The agencies' procedure may not have been ideal, but in the eyes of the judge, it was legal.

With the court challenge lost, Marathon moved quickly to exercise its development rights. It drilled a deep hole—5,000 feet—in the summer of 1985, but found no oil. "We all breathed a sigh of relief when we found that it was a dry hole," a state BLM official told Sierra Club Treasurer Phil Hocker. According to Schmalz, there were few signs of sadness along the North Fork when Marathon pulled out its drill pipe and flew away.—*B.H.*

WHERE HAVE ALL THE SONGBIRDS GONE?

JOSEPH WALLACE

THE LAMENT IS HEARD among birdwatchers in the United States every spring. "Sure, migration's great," they say, scanning the forests in search of warblers, tanagers, flycatchers, and other returning species, "but it's nothing like it used to be. Years ago, the birds would arrive in a flood. Now it's barely a trickle."

It's easy to dismiss these worried words as the unfounded complaints of nostalgic oldtimers. After all, people who were birdwatching decades ago may not get into the field as often as they once did, or their favorite areas may have changed in subtle ways. But there has never been solid evidence that many American bird species are declining throughout much of their range.

Until now. In recent years scientists across the country have been taking a closer look at the scores of migratory bird species that nest in the United States and winter in the tropics. Their findings are cause for alarm, for they reveal a growing danger to many of our most colorful and popular species. Warblers, tanagers, flycatchers, and many other migratory birds are facing a battery of threats that may soon lead to the regional extinction of several species—and could eventually lead to the total extinction of some. "The problems are already extremely serious in many parts of the country," says biologist David S. Wilcove of Princeton University, "yet few people even know they exist." The causes of this avian emergency are frighteningly complex; many are still barely understood. But all researchers agree that one of the greatest dangers lies outside the United States, in the forests of Latin America where so many of these birds spend more than half the year.

Throughout the world, tropical forests are being cleared at an astounding rate. Jungles are being turned into cattle pasture, building developments, and farmland. Ironically, much of this cleared land is infertile; a typical tropical forest will stand on only an inch or two of topsoil, which rapidly disappears once the trees are felled. Within a few years the land is reduced to a virtual desert. Then still more forests are cleared, leaving behind vast expanses of ruined land.

Estimates vary, but experts believe that somewhere between 25 and 100 acres of tropical forest are lost each minute—which will mean the disappearance of much of the world's remaining forest by the end of the century. According to Eugene Morton, a research zoologist at the National Zoo in Washington, D.C., the problem is especially grave in Latin America, where as much as 2 percent of the jungle is cleared each year. "You can see the changes every time you visit," he says. "Areas that were untouched just a few years ago are now pastures overrun by cattle."

Migrant bird species are particularly vulnerable to this unending cycle of habitat destruction. Some are territorial, accustomed to returning to the same site each year. When their home forest disappears, they soon follow. Certain species depend on localized foods, while others may need to interact with nonmigratory tropical species that also disappear with clearing.

The problems of migrants are particularly urgent in the Caribbean area. "Quite a few migrants are confined to these islands, where the forests are under severe assault," Morton says. One such species is Bachman's warbler, which formerly bred in the moist woodlands of the southeastern United States and wintered exclusively in Cuba and nearby islands. The warbler's winter habitat has now been converted almost entirely to fields of sugar cane, and the bird is either extinct or nearly so.

Even on the tropical mainland, the situation is grim. "Tragically, the lushest forest areas are often the first to disappear," says Morton. In Mexico and Central America, where overpopulation and political instability are ongoing threats to wildlife, some of the most vital areas are already gone, and others are soon to follow.

Until recently scientists believed that some disturbance of tropical habitats might actually be advantageous to the migratory songbirds, at the expense of resident species. "Scientists thought the two populations were in competition with each other," Morton says, "so if an area was partly cleared, the migrants might benefit."

Two censuses by John Rappole of Texas Agricultural and Industrial University disproved that theory. In the early 1970s he studied migrants in the Veracruz province of Mexico. When he went back with other biologists a decade later, the study areas had undergone significant development. The researchers found that the number of migratory species had declined 42 percent. "We have to realize that our birds are an integral part of tropical ecosystems," says Morton. "Where the land has been disturbed, almost all species suffer." Only a few species—the barn swallow being

A landmark collaboration by the heads of the 10 leading American environmental organizations addressing the crucial national and international issues affecting our planet.

Yes, please send me _____ copy(ies) of AN ENVIRONMENTAL AGENDA FOR THE FUTURE written by the leaders of America's 10 leading conservation organizations. I appreciate the low price of $6.95 including $1.00 for postage. Allow 4-6 weeks for delivery.

Name_____

Address_____

City_____

State_____ Zip Code_____

☐ Payment Enclosed_____ Total Amount ($6.95 each)

Maryland residents add 5% sales tax

Please charge my ☐ VISA ☐ MASTERCARD

Card Number_____ Exp. Date_____

Cardholder's Signature_____

ISLAND PRESS is a nonprofit press dedicated to the distribution and publication of books for professionals and concerned citizens in the natural resource conservation/environmental field. You can help ISLAND PRESS do its job by providing the following information.

Please indicate your 3 primary areas of interest.

1. Soil ☐
2. Water ☐
3. Hazardous Waste Management ☐
4. Land/Parks/Urban Open Spaces ☐
5. Agriculture ☐
6. Wildlife ☐
7. Forests ☐
8. Energy ☐

You are

☐ a professional in conservation and/or are
☐ an active participant in conservation organizations.

Thank You.

☐ Please send me the new ISLAND PRESS catalog. It's free.

"AGENDA . . . addresses the most serious questions about the future of our resources."
Senator John Chafee

"Recommended to all my colleagues . . ."
Congressman Edward Markey

"AGENDA . . . an extremely valuable tool."
Robert Redford

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 15715 WASHINGTON, D.C.

Postage will be paid by

ISLAND PRESS
P.O. Box 53406
Washington, DC 20009

one example—respond favorably and actually increase where the land has been cleared.

While the havoc wrought by tropical deforestation has been well documented by everyone from birdwatching tourists to the editors of *Global 2000*, Wilcove and other scientists believe that some of the causes of the decline in songbirds lie much closer to home. "There's no doubt that migrants will disappear if their winter homes continue to be clear-cut at the current rate," says Wilcove. "But we still know far too little about what effects changes in the environment here in the U.S. have on nesting migrants."

Wilcove has been studying the small woodlots that dot the suburbs and many rural areas of the Northeast. In these forest fragments, he claims, songbirds that should be nesting in large numbers are often rare or entirely absent. For example, the Kentucky warbler seems to be appearing in smaller numbers at its northern breeding grounds, while other species—including the ovenbird and American redstart—have virtually vanished from woodlots within their range. Even in larger forests there is evidence of decline that cannot be attributed entirely to tropical deforestation: The red-eyed vireo, whose wintering grounds in the Amazon River basin are as yet relatively untouched, has also been a victim of sharp decreases in many small tracts. The problem seems to lie with the woodlots themselves.

"There are many reasons why these patches of forest may be inhospitable to migrants," Wilcove explains. "We need to discover if a woodlot's isolation prevents migrants from finding mates. Does the presence of fields or roads between plots form a barrier?"

Furthermore, only a few studies have tried to determine the changes in food resources caused by shrinking forest fragments. Populations of insects may fluctuate, eliminating necessary food for some species. Small suburban groves may also suffer from the effects of

Declining populations of migratory birds may give new urgency to "silent spring."

© Sonia Vireo

The Northern parula is one of several migrant warblers at risk. Below: a cut in Panama.

exhaust fumes from nearby roads, while in certain regions the harm caused by acid rain and pesticides must be studied more fully.

Wilcove has been concentrating on several of the most important threats to wildlife in northeastern forests. "I'm very interested in forest edges," he says. "For many years wildlife managers have considered edges beneficial to animals that live in the interior of the forest. Actually, while they're great for white-tailed deer, bobwhite, and other game, edges are disastrous for forest-dwelling songbirds. Wherever you have a forest edge, you'll see a negative impact on the nesting birds."

For one thing, forest edges may encourage nest predation. In a series of studies using wicker open-cup nests and quail eggs, Wilcove found that the rate of predation in small suburban woodlots in Maryland approached 95 percent. Rural fragments showed much less predation, while in Great Smoky Mountains National Park in Tennessee and North Carolina—a relatively large, undisturbed forest tract—predation was negligible.

"Confirmed nest predators include dogs, cats, raccoons, and blue jays," Wilcove says. "In the suburbs there has been a boom in the population of all these species, while such top-level predators as bobcats and large raptors—which might control the population of smaller nest-robbers—have nearly disappeared. As a result, you simply can't find nesting migratory songbirds in many small plots. They've been driven out entirely."

Another serious threat to migrants is parasitism by brown-headed cowbirds. These common blackbirds, which lay their eggs in the nests of many different species, have undergone a dramatic population rise throughout their expanding range.

Historically, cowbirds were found alongside the huge herds of bison that once roamed the Great Plains. With the settling of the eastern United States and the clearing of the forests for pastureland, the birds began to spread. "Now they're common almost everywhere in the Northeast," says Wilcove. "And the birds they're parasitizing haven't had a chance to develop any defense against them."

Studies have shown that migratory songbirds suffer much more from both parasitism and nest predation than do permanent residents such as tufted titmice, black-capped chickadees, and downy woodpeckers. One of the reasons is that migrants usually place their open-cup nests on the ground or in low shrubbery, where they are easily found by blue jays, raccoons, and other robbers, while year-round residents nest in cavities and are therefore less vulnerable.

"We've also found that most migrants raise only a single brood each spring," Wilcove adds, "while residents often raise two or three over a summer. Since

cowbirds parasitize mainly in the spring, migrants suffer the most."

Perhaps the most famous example of the perils of cowbird parasitism involves the rare Kirtland's warbler, whose population declined 60 percent over a ten-year period to about 200 pairs in the early 1970s. After the removal of thousands of cowbirds from the Kirtland's forest habitat in Michigan, the warbler's numbers stabilized.

Based on the evidence, the plight of our nesting migrants seems nearly hopeless, the ongoing decline irreversible. But according to both Wilcove and Morton, the trend can be halted—or at least slowed—through the efforts of private citizens, environmental organizations, and the federal government.

"Although there has already been significant destruction of tropical forest, the true tragedy will come when the coastal Caribbean forest, which still stretches from Belize southward, begins to disappear," says Morton. In response to this threat, the World Wildlife Fund, The Nature Conservancy, the Sierra Club, the governments of several Central American countries, and other groups are looking for ways to preserve this relatively unspoiled forest. The establishment of the Braulio Carrillo National Park in Costa Rica, which safeguards a large and varied forest tract, is one encouraging recent result of this kind of cooperation.

Along with the preservation effort, studies are needed "to learn more about what happens to the migrants on their wintering grounds," Morton says. "We don't yet know where many of the birds go or what they eat. If we're going to save land for them, far more research will be necessary."

Morton also agrees with Wilcove that further study of nesting migrants in the United States is needed. "But we already know enough to make us reconsider the way we manage our reserves," Wilcove says. "For example, when officials bulldoze a road or put picnic areas in a large forest, they're essentially inviting jays, cowbirds, and mammalian predators into the forest. Many migrant species simply cannot handle the increased pressure."

At the same time, the Sierra Club and other organizations must continue to fight against the ongoing abuse of America's national forests. Clearcutting, a common Forest Service practice throughout the country, is obviously catastrophic for nesting species in the disturbed areas; but even selective cutting over a large area may be a serious threat. The solution is to leave large patches of mature forest untouched, or at least adopt a long-term rotational cutting plan that allows second-growth forest to reach maturity before harvesting —a practice the Forest Service shows no sign of following.

"In the future, the last refuges for migratory songbirds in the United States will be the large national parks and forests," Wilcove concludes. "If we don't start managing these areas with an eye toward protecting all nesting species—even those that don't currently seem rare —we may soon witness a new silent spring in many parts of the country, a migration season lacking some of our most cherished birds." ■

Joseph Wallace is a nature writer based in New York City.

D. Cavagnaro/ DRK Photo

Jeff Foott/ Tom Stack & Associates

Robert C. Simpson/ Tom Stack & Associates

David Wilcove

The Kentucky warbler, a species of songbird that may be the victim of both tropical grazing and northeastern clearcutting. The cowbird at right is the unwelcome guest of a yellow warbler. Forest edges (below) encourage such predation.

WALKING HIT

JONATHAN F. KING

"We have a Secretary of the Interior who not only walks but climbs, and a justice of the Supreme Court who writes books shamelessly describing his pedestrian exploits. It looks as though walking, not riding, is about to become a status symbol."

Joseph Wood Krutch (1964)

TIME FLIES, and today the great naturalist would probably want to reconsider the first part of his statement in light of recent politics. After all, the most notable Interior Secretary of the 1980s had his hands full just climbing out of the hole he'd dug for himself, while the current crop of Supreme Court justices is one of the most pedestrian we've seen . . . though not in a way that William O. Douglas would have admired.

Krutch, however, was farsighted indeed when he noted that walking was on its way to becoming *the* thing to do. Sure, he failed to predict the jogging craze that would come first, but how could even the wisest seer have known that America had to run before it could walk?

But now that nearly everyone who ever gave the slightest thought to running their way to health and happiness has tried it (and, for the most part, given it up), the attractions of walking should be more seductive than ever. Testimonials abound that it is among the easiest, most pleasant fitness regimens a person can follow. It's also one of the most effective; in fact, walking appears to be something of a cure-all for numerous ailments, physical and emotional.

There are, of course, various ways of moving about on foot, and not all of them yield the considerable therapeutic advantages of brisk, nonstop walking. But every style has its benefits and its charms, from the stop-and-go, poke-and-sketch amble of the amateur naturalist to the determined, weight-added stride of the power walker. Settle on the approach that suits you best, and you'll find that the basic motor skill you mastered and then forgot about so long ago can be the key to a lifetime of health and enjoyment.

Everybody thinks they know how to walk—but the fact remains that there are right and wrong ways to go about it. This man has his feet close together, his toes pointing almost directly outward: so far, so good. But his reliance on a straight-legged technique—typical of people who do most of their walking on pavement—will likely lead to fatigue after even a short distance.

MOST READERS of *Sierra* are at least occasional hikers, and many have logged a fair number of miles under a backpack. These activities involve walking, of course, but of a different kind than we're looking at here: walking you can do without special equipment and without having to sleep out at night. Thus, trekking, backpacking, snowshoeing, cross-country hiking, and walks into, through, and around time are beyond our scope. Instead we'll take a look at the exercise's physical and psychological benefits for the semi-sedentary, urban or suburban citizen struggling with listlessness, battling the bulge, wrestling with tension and anxiety, or in general having a tough time with the stresses and demands of modern life.

Everyone knows that walking is the exercise of choice for people who have suffered heart attacks. It helps recondition damaged heart muscle, which is why many cardiologists routinely prescribe walking for their recovering patients. But not everyone is aware of the extent to which walking can *prevent* heart attacks and other forms of heart disease.

It's the consensus of informed opinion—based on recommendations by cardiologists, exercise therapists, and others working in the areas of health and fitness—that normal people whose daily lives are essentially sedentary can profit greatly from regular walks, especially if taken at close to top speed. These walks should last at least 20 minutes to be of benefit, and can comfortably be extended to at least an hour. Most people can walk at a maximum pace of between four

S ITS STRIDE

and five miles per hour, so we're looking at a total distance of between one and a half and five miles. (Some specialists say taking a brisk walk three days a week is sufficient, while others swear by the daily regimen. But all agree that regular walking is just about the best thing you can do to keep your heart in shape.)

Does five miles a day sound like a long way to go? No need to drag out our parents' hoary tales of seven-league schleps to school to put things in perspective. Consider that even the "typical" sedentary American worker averages between two and three miles per day just padding around the office, walking to and from lunch, and so on. Adding two briskly paced miles to that total requires finding time for just two 20-minute walks of a mile each. As a walker's stamina improves—and it won't take long—he or she will find that making time for five extra miles above and beyond the workaday total won't be much of a sacrifice. In fact, a mild and positive addiction may result, perhaps surprising the walker who discovers that this form of exercise is far more enjoyable than any other previously encountered, notwithstanding the very real benefits to health and appearance that will follow.

But, you may wonder, is plain old walking as good a form of exercise as, say, jogging? Absolutely, the experts reply. Dr. Kenneth Cooper, founder and director of the Aerobics Center in Dallas, says "Walking at a brisk rate of four to five miles an hour for 30 to 45 minutes . . . exercises the heart at the same rate as 20 to 30 minutes of medium-paced jogging." And this benefit can be yours whether or not you drape yourself in a designer-name velour warm-up suit—although you will most likely have to get along without the painful shin splints, stress fractures, Achilles tendinitis, plantar fasciitis, chondromalacia, and other ailments suffered by many who run seriously.

It's not only the extremities that prosper when you chose to walk instead of run. Your heart will appreciate the reduced strain too, as any number of cardiologists attest. Here's Dr. Meyer Friedman, who first identified the Type A syndrome and its connection to heart disease: "As opposed to walking—which allows the human being to be an observing, thinking individual better aware of things that grow in the ground and move over it—jogging seems to me to be the sport in which all one's brains go down to the legs. . . . This miserable post-collegiate travesty has already killed at least scores, possibly hundreds, of Americans."

Only in running do both feet leave the ground simultaneously. The walker invariably supports body weight on the rear leg while preparing to touch the ground with the forward one. These people have the general idea; note also that they are comfortably dressed in loose-fitting clothing.

Dr. Friedman's colleague, Ray H. Rosenman, says that while "appropriate" jogging to maintain a level of fitness may be a good thing for those who want to indulge in it, "many programs have increasingly been urging people to simply run faster, run farther, and constantly try to drive up their heart rates for what in many instances may be too high and too long." He notes that in such individuals "the risk is engendered not only of increasing orthopedic-type injuries but of precipitating myocardial ischemia [lack of oxygen in the heart muscle], which may in turn precipitate cardiac arrhythmias that can cause sudden death. Indeed, this has occurred in many persons from excessive jogging and running."

The evidence further indicates that the cardiopulmonary and circulatory systems as a whole, in addition to the heart muscle itself, are positively affected by walking. In a key

"I'm walkin', yes, indeed!"
Fats Domino

"I never knew a man go for an honest day's walk for whatever distance, great or small . . . and not have his reward in the repossession of his own soul."
G. M. Trevelyan

"Surely the pedestrian may claim for his recreation this advantage: it may be enjoyed when one will and wherever one may be."
Bayard H. Christy
Going Afoot *(1920)*

"Where all other athletes must be in attention to the way they move, the walker can find his inner world (and outer world, too) no more than a short stroll from home. He steps out his front door, views the universe and knows that it is good. The walker has found the peace that the runner still seeks."
Dr. George Sheehan

"I've just finished a story called 'The Pedestrian' [1951]. There's a traffic problem now, and it's possible that some years hence the pedestrian will be outlawed. I have a fellow taking a walk one night, and a traffic car eases up alongside him. There are robots in this police car, and one of them asks the pedestrian what he's up to. 'I'm taking a walk,' he says. 'Why?' the robot asks. 'To breathe some air,' the fellow answers. 'But you've got an air conditioner,' the robot says. 'I wanted to see things,' the fellow says. 'But you've got a television set,' the robot says. Anyway, the pedestrian gets taken off to an insane asylum."
Ray Bradbury
From The Writer Observed
by Harvey Breit (1956)

study conducted in 1971, a team of physicians at Wake Forest University monitored the progress of 16 sedentary middle-aged men who were asked to walk 40 minutes a day, four days a week, for 20 weeks. At the end of that period the subjects' maximum oxygen intake capacity had improved by 28 percent, while their blood pressure and heart rate recovery times decreased significantly. The amount of ground they covered in 40 minutes increased from 2.5 miles to 3.2 miles (an increase in average speed of nearly a half mile per hour). And, as an added benefit, they all lost weight (up to six and a half pounds, mostly from the waist and buttocks) and body fat (up to 3 percent).

This brings the discussion around to another great benefit of walking: its contribution to weight control. It will come as welcome news to the 70 million Americans known to be overweight (at least 617 of whom, our research shows, have yet to join a health club) that walking is nearly as effective a weight-reduction technique as running. In fact, it can be every bit as effective; you just have to do slightly more of it.

How much more is really up to you, and it depends almost entirely on how fast you want to lose those excess pounds. Because six miles of full-bore running burns up 20 percent more calories than walking the same distance, only the most impatient dieter might prefer to jog than jaunt. And although a high-speed walk (four to five miles per hour) provides the optimal benefit, once again the difference is not all that great compared to a more moderate pace of, say, three miles per hour.

"With only some small variations, a given walker will burn about the same number of calories walking one mile slowly as when he or she walks faster," Phil Bishop of the University of Alabama's Human Performance Lab told *Walkways* magazine. "Very fast walking . . . burns slightly more calories per mile than slow walking or even slow jogging." The importance of walking speed is relative to other factors, including the time you spend walking as well as your weight and caloric intake. (Overweight people lose weight rapidly at the beginning of an exercise program based on walking because of the extra energy required to move a heavy object through space.)

There's still more good news for the moderate walker: If you're walking to lose weight rather than to improve aerobic capacity, it's not as important to walk for unbroken periods of time. A calorie lost is a calorie lost, whether you string them together over a 20-mile hike or strip them away six at a time while walking to the store.

Does this mean the glazed doughnut will once again be an honored visitor to America's breakfast nooks? Can we all now eat whatever we want with impunity (and a side of slaw)? Before you dash—excuse me, *walk*—over to your local hot-fudge distributor to lay in a year's supply, remind yourself that regular walking in conjunction with a sensible diet is a far more effective weight-loss strategy than a walking program alone (or a diet alone, for that matter). Walking off excess calories stored in your body is fine; if

"The first joys of walking," one writer has said, "are reserved for those who walk alone." Yet no one will deny the special character of walks taken with one or more boon companions, particularly when the weather would otherwise seem discouraging.

you continue to take them in as food, though, the benefits will obviously be marginal. Far better to walk regularly while reducing your caloric intake: that's when the pounds and inches will really start to drop off . . . especially because walking causes you to lose weight more or less evenly from fat reserves all over your body, not just in the areas around your legs and the other major muscle groups being exercised.

In addition to conditioning the cardiopulmonary system, improving aerobic capacity, and contributing to weight loss and maintenance, walking is held by many physicians and researchers to have a beneficial effect on posture, lower back problems, res-

piration, digestion and elimination, even serum cholesterol and high blood-pressure levels.

Does all this sound too good to be true? How can anything so marvelous not carry with it an immense burden of deprivation, agony, and guilt? Well, it's easy enough to find out which of these extravagant-sounding claims have merit for you—as easy, in fact, as putting one foot in front of the other.

"Walking takes in a lot of territory, far more than is commonly realized. Anything so fundamental is bound to possess ramifications."

Elon Jessup
A Manual of Walking (*1936*)

LONG BEFORE modern medical science began its systematic investigation of the ways in which walking could improve physical health, it was widely recognized that walking is one of the best ways to reduce stress, maintain emotional balance, and encourage creative thought. Philosophers and poets have sung its praises through the ages, and the literature of walking yields an extensive and impressive inventory of testimonials.

Those who exercise regularly or rely on their bodies in the course of daily life are aware that the body's condition has a direct impact on the functioning of the mind. Negative examples of this phenomenon may include glandular disorders and nutritional deficiencies; outdoor athletes could add to this list the oxygen deprivation disorders associated with mountaineering and ocean diving.

On the other hand, someone enjoying perfect health would likely mention the absence of stress and tension as the most notable aspect of this enviable condition. That's because the body's smooth functioning is contributing to that person's strong sense of emotional well-being. All of us are familiar with the psychological stresses of modern life, especially in its urban expression: the noise, crowding, and traffic; the pressure to compete and succeed, or even just make a living. These all produce emotional reactions—including anxiety, depression, irritability, and impatience—which in turn manifest themselves on the physical plane as backaches, headaches, fatigue, high blood pressure, ulcers, insomnia, and so on.

This connection between mind and body means there's bad news and good news. The bad news can be a self-perpetuating cycle of negative mental and physical effects, from which it can be devilishly difficult to extract yourself. For example, a person of normal metabolism who eats too much and exer-

"I do not approve of . . . leaping and running. Both of these hurry the respiration; they both shake up the brain out of its glorious open-air confusion; and they both break the pace. Uneven walking is not so agreeable to the body, and it distracts and irritates the mind."
Robert Louis Stevenson
Virginibus Puerisque

"I think that I cannot preserve my good health and spirits, unless I spend four hours a day at least,—and it is commonly more than that,—sauntering through the woods and over the hills and fields, absolutely free from all worldly engagements."
Henry David Thoreau
"Excursions" (1862)

"Because walking can never again be what it was—the motor-cars will see to that—it is our duty to pay it greater reverence and honor."
Christopher Morley (1917)

"I am not going to advocate . . . the abandoning of the improved modes of travel; but I am going to brag as lustily as I can on behalf of the pedestrian, and show how all the shining angels second and accompany the man who goes afoot, while all the dark spirits are ever looking out for a chance to ride."
John Burroughs
"Exhilarations of the Road"

"Walking, the human design comes into its own. Form blends with function and the result is harmony—and perfect performance. The body is built for action, and the action for which it is specifically built is walking."
Aaron Sussman
and Ruth Goode
The Magic of Walking *(1967)*

"There is no reason for boasting of walking as though it were a special talent or virtue possessed by an endowed few."
John Kieran
"A Spring Walk"
Collier's, *April 18, 1953*

"The effects on the heart of an endurance activity like walking are all positive. Your resting heart rate (pulse) will be lower. This lets your heart rest longer between the 100,000 beats it must make every day just to keep you alive. Exercise through walking will increase the stroke volume of the heart—that is, the amount of blood pumped with each heartbeat. It will lower the blood pressure and improve the ability of both the heart and blood pressure to recover from strenuous activity. It will make the heart muscle stronger and increase the elasticity of the arteries, which improves the carrying capacity of the capillaries in the heart and in other muscles."
Gerald Donaldson
The Walking Book *(1979)*

"I have often started off on a walk in the state called mad—mad in the sense of sore-headed, or mad with tedium or confusion; I have set forth dull, null and even thoroughly discouraged. But I never came back in such a frame of mind, and I never met a human being whose humor was not the better for a walk. It is the sovereign remedy for the hot-tempered and the low-spirited—provided, of course, that you know how to walk."
Donald Culross Peattie
"The Joy of Walking"
New York Times
Sunday Magazine
April 5, 1942

cises too little is likely to gain weight. The physical and emotional problems that often result from being overweight can lead to depression and ill will; the person may then try to ease this psychic pain by eating still more (and probably exercising even less). A vicious cycle is established, and will probably endure.

There are a number of escape routes from this dilemma, however. The condition can be seen as either psychosomatic (conditioned by the mind's powerful influence over the body) or somatopsychic (a less familiar word that reflects the body's power to affect the mind). Psychological problems can often be difficult to pinpoint, analyze, treat, and cure. But the physical causes of the kind of syndrome we're talking about here, unless rooted in organic illness, can often be addressed and relieved through exercise.

And so we come to the good news: Walking, already one of the most nearly perfect all-around physical exercises, is also one of the most effective, most pleasant, and cheapest emotional therapies available this side of a heart-to-heart encounter—"a true magic,"

Wet feet are the walker's bane. After a long walk, treat your feet to a warm soaking and a cool rinse, followed by careful drying and a carefree powdering. Whenever possible, put on fresh, dry socks afterward.

it's been called, "a psychophysical alchemy [that] transforms the body and the mind." While psychosomatic and somatopsychic problems are both real and intimately interconnected, it's often easier to work on soma before psyche. The angst-ridden businessperson taking the taxi uptown once a week to see an analyst would be a lot better off choosing to walk those blocks instead; he or she might end up stopping in only to cancel the appointment, then to proceed, jaunty-jolly (in Mel Brooks' phrase), along the way.

Walking can be used as an escape from tensions and troubles, but it is also a way of putting thoughts and feelings in order. "The jolt of even the smoothest gait," Hal Borland of *The New York Times* has said, "tends to loosen ideas, give them a chance to rub against each other and mingle and find new proportions and arrangement." The French philosopher Rousseau said of a walk, "Never have I thought so much, never have I realized my own existence so much, been so much alive." The endorsements pile up: "The more you walk," say Aaron Sussman and Ruth Goode in their excellent guide, *The Magic of Walking*, "the better you feel, the more relaxed you become, the more you sense, the better you think, the less mental clutter you accumulate." The loose but rhythmic motion of legs, hips, and arms, together with the regular pattern of breathing that walking encourages, serve to calm the anxious mind or stimulate the jaded one.

It might all sound contradictory in theory, but it works famously in practice. As with the physical benefits of walking, to test its psychological appeal you have but to try it. No special equipment is needed other than well-constructed shoes and loose, comfortable clothing; no physical skills beyond those acquired in your second year; no personality traits other than the ones you already possess, for good or ill.

Walking is a natural function of the human condition, so it should come as no surprise, when all is said and done, that its proper practice is a fundamental key to human health and happiness. Whether you hit the high road on a cross-country hike or, like Thomas de Quincey, walk around your garden 440 times a day, you'll find, along with Emerson, that "'Tis the best of humanity that goes out to walk." ■

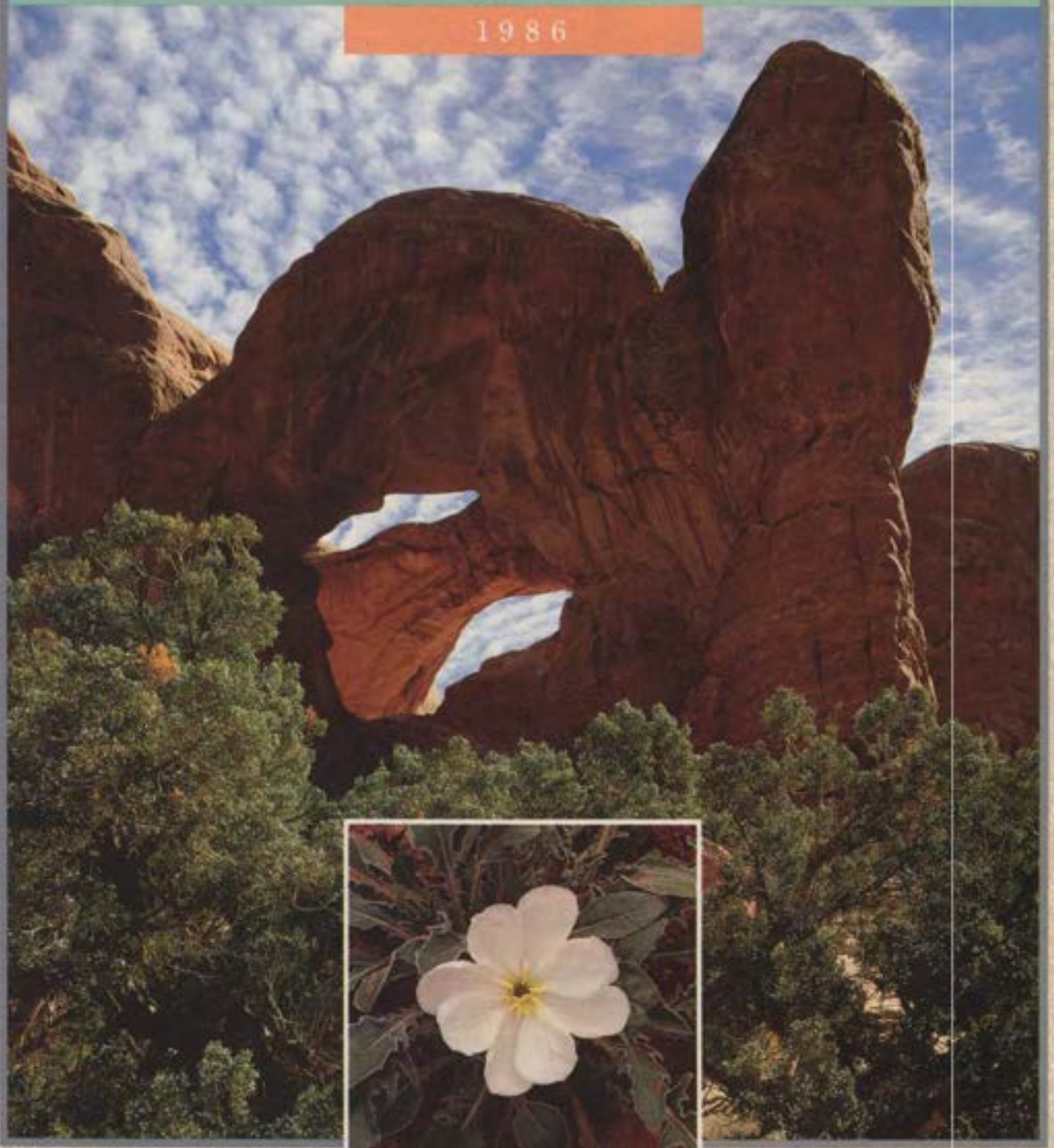
Jonathan F. King *is an associate editor of* Sierra.

SPRING TRAVEL GUIDE

PARKS & PLACES

SPECIAL ADVERTISING SECTION

1986

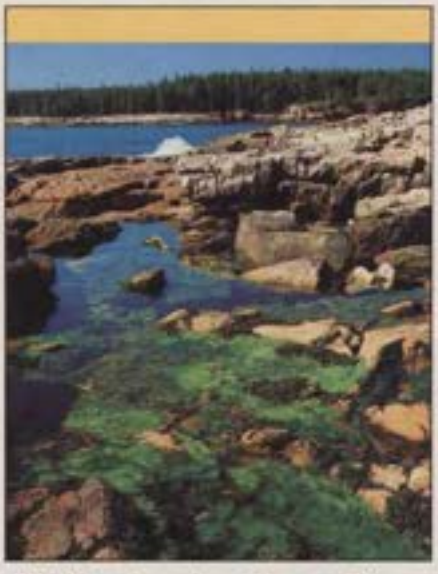


THE PACIFIC TOURIST, the "Illustrated Trans-Continental Guide of Travel from the Atlantic to the Pacific Ocean," told travelers how to reach the new Yellowstone National Park in 1884. Take the Utah and Northern Branch Union Pacific Railway from Ogden, Utah, to Dillon, Montana, it advised, and then catch the stagecoach from Dillon to Virginia City, "principal outfitting place for the Yellowstone Park, distant 100 miles." Travelers were warned off a route that was 482 miles shorter, because "it is often unsafe on account of Indians."

Yellowstone excursionists little realized they were laying the foundations for a tradition of travel to national parks that a century later would involve some 264 million visits annually.

Today the excursionist has a choice of car, camper van, bus, bicycle, jet, and sometimes train to get close to Yellowstone or any of the other national parks. The journey still has the flavor of a 19th-century expedition if the traveler elects to explore park wilderness on foot, horseback, or by canoe or raft. Modern parks also provide a range of less taxing experiences, from drive-through-and-look journeys and comfortable stays in maintained campgrounds, rustic cabins, or luxury lodges to escorted tours with emphasis on either sightseeing or action.

In short, there's a way for every traveler to enjoy the treasures of national parks. In the following pages we sample vacation possibilities in selected American parks, then move on to the Pacific and Europe, where the concept of national parks sometimes takes on an unfamiliar face.



Rich tidepools, such as this one at Ship Harbor, are part of Acadia's rugged coastal appeal. Photo © Willard Clay.

ACADIA, ON THE COAST OF MAINE

If you know the stern and rock-bound coast of New England only from literature, plan a visit to a corner of that coast at Acadia National Park, a realm of glacier-cut granite located halfway up the ragged Maine coast. The heart of Acadia is on Mt. Desert Island; other segments of the 65-square-mile park are on wild Isle au Haut, a handful of islets and the tip of the Schoodic Peninsula.

Acadia is no wilderness park. Old fishing villages line the shores of Mt. Desert, and rich easterners began building summer retreats here in the mid-1800s. It was with summer folk who donated land for a reserve that Acadia had its genesis. Today's walkers can follow 43 miles of gravel carriage roads built by John D. Rockefeller, Jr., who deeded 11,000 acres.

Lakes and beaver ponds; forests of pine, spruce, cedar, and hardwood trees; the bald granite summit of 1,530-foot Cadillac Mountain, highest point on the Atlantic coast; 300 species of birds; a fringe of rich tidepools; and the moody Atlantic are all part of the Acadia mix.

- *Travel hints.* Some 2.5 million motorists cross the causeways to Mt. Desert Island annually, and August is high season. Two campgrounds are open in summer, and hotels and inns can be found in Bar Harbor.

While Acadia is easily accessible from any point in New England, newcomers to the region may want to drive there from Boston, moving north along the coast through Massachusetts, New Hampshire, and Maine, stopping to see a witch

Parks & Places; March/April 1986; published by Sierra, *730 Polk St., San Francisco, CA 94109, (415) 776-2211; written by Shirley Fockler for* Sierra. *Cover photos © Jeff Gnass. Since much of our information must be gathered in advance, we suggest you consult your travel agent for details on tour packages, itineraries, schedules, and accommodations.*

THE BEST OF ALASKA. FREE!

"My advice to anyone planning an Alaska vacation on their own—get your hands on this guide!"

If you're planning your own Alaska vacation this year, begin with Exploration's ALASKA FOR THE INDEPENDENT TRAVELER brochure.

Here's why. Alaska is immense. There are dramatic memorable vacations there for every person, taste, style and interest.

ALASKA FOR THE INDEPENDENT TRAVELER gives you all those choices—in one place!

Here is the ALASKA FOR THE INDEPENDENT TRAVELER plan- your-own vacation guide.

The guide that truly gives you the best selection and best choices in the Great Land—all organized and designed to be used to plan your vacation.

The best experiences in Alaska! We've put everything into our independent travel brochure: the **Arctic, Pribilof Islands, Glacier Bay National Park, Mt. McKinley**—the best of Alaska!

For a very personal discovery of Alaska!

Nothing compares to cruising the magnificent Inside Passage aboard our Explorer Class® ships.

Exploration's ALASKA FOR THE INDEPENDENT TRAVELER. It carefully explains all your choices.

Everything is here for planning your own Alaska vacation. Each city in detail. Wonderful accommodations. Cruising the Inside Passage. Attractions. Activities. Transportation. Special hints on planning and what to experience. And all the prices and information you need to plan your Alaska vacation.

Also, the best tours, cruises and cruise tours to Alaska!

If you want the convenience of a preplanned locally hosted vacation—ALASKA FOR THE INDEPENDENT TRAVELER is also for you. Each preplanned vacation is designed for your comfort and ease, and includes the best Inside Passage cruises, cities and attractions of Alaska.

Ask us: you can have the Alaska vacation you want.

We've got the best selection of Alaska travel, cruises, attractions, and value-packed vacations for 1986.

See your travel agent or **call us toll free at 1-800-426-0600** (in Seattle, call 624-8551) to request your free ALASKA FOR THE INDEPENDENT TRAVELER vacation guide. Some of our unique and very special experiences of Alaska often sell out quickly, so plan now and make your reservations early to ensure the vacation you want.

U.S. Registry

Yes, please send my free ALASKA FOR THE INDEPENDENT TRAVELER brochure.

Exploration Holidays and Cruises
1500 Metropolitan Park Bldg
Dept. **BAF**
Seattle, WA 98101

NAME

ADDRESS

CITY STATE ZIP

PHONE

EXPLORATION®
HOLIDAYS AND CRUISES
A DIVISION OF EXPLORATION CRUISE LINES, INC.
ONE OF THE ANHEUSER-BUSCH COMPANIES

museum, 17th-century colonial houses, the home of L. L. Bean, and the Farnsworth Museum, repository of paintings by Andrew Wyeth and Winslow Homer.

Channel Islands, America's Galápagos

The Channel Islands, eight chunks of land off the Southern California coast, are often called America's Galápagos. Long isolated from the mainland, these islands are a home to plants and animals found nowhere else, including 85 rare and endangered plant species and a cat-size island fox and spotted skunk. The islands also hold a rich cross section of fossils, archaeological sites from 6,000 years of Indian occupation, breeding grounds for seals, sea lions, and elephant seals, and a brown pelican rookery.

In 1980, five islands—Santa Barbara, Anacapa, Santa Cruz, Santa Rosa, and San Miguel—and their surrounding seas were declared the Channel Islands National Park and National Marine Sanctuary.

- *Travel hints.* Only Santa Barbara and East Anacapa have (primitive) campgrounds and ranger stations. Trails are maintained here and on San Miguel. Park concessionaire Island Packers offers scheduled trips and charters from Ventura for day visitors, skin divers, and campers.

Ventura, embarkation point for travel to the islands, is easily accessible just north of the Los Angeles basin. Travelers from beyond L.A. should find the city of Santa Barbara, north of Ventura, a pleasant stop before and after a Channel Islands visit. The old mission, beaches, and sophisticated resort hotels are Santa Barbara hallmarks.

Denali, Alaska's First Park

Founded in 1917 as Mt. McKinley National Park, Denali is now one of eight giant national parks in Alaska. With 20,320-foot Mt. McKinley as its centerpiece, this first Alaskan national park was set aside to protect a rich concentration of wild-

Dall sheep are among the wildlife protected at Denali. Visitors might also spot caribou, wolves, and moose. Photo by Russ McCubbin / Wilderness Travel.

life, including grizzly bears, caribou, Dall sheep, wolves, and moose. The richness remains, and the park is more than double its original size, or roughly equal to Massachusetts. As the most easily accessible of Alaska's national parks, Denali, like some of its Lower 48 park cousins, has traffic problems.

A journalist visiting Denali last year headlined his story "A park that's being loved to death." He claimed the number of animals being sighted along the park's one road was declining in direct proportion to the growth in visitors coming to see wildlife. The visitor total is now near 400,000 for the brief summer season.

The Denali road commences at the Riley Creek entrance on the eastern edge of the park and winds 85 miles in a more or less westerly direction to Wonder Lake. En route it climbs four passes, crosses five rivers, and provides the magic access to animals. Mt. McKinley comes into view, weather permitting, at about mile ten. Six camps are along the road, the last at Wonder Lake, and Eielson Visitor Center is at mile 60. After the 12-mile marker, traffic is restricted to buses and a few private vehicles.

• *Travel hints.* If a day trip to Denali to view scenery and wildlife will suffice, you can ride the first-come, first-served park service buses or make reservations for a tundra tour operated by the park concessionaire. If you want to camp, you can drive to your campground (if your vehicle meets size restrictions), or join sightseers and backpackers on the park service bus.

If you want to enjoy more comfort than a camp permits, you can book into rustic Camp Denali resort near Wonder Lake or nearby Kantishna Roadhouse, a historic mining area with cabin lodging and family-style meals. Denali National Park Hotel and McKinley Chalets provide rooms at Riley Creek, which can be reached by car on Highway 3 between Anchorage and Fairbanks, or by Alaska Railroad's daily summer service between the two cities.

Comprehensive Alaska tours, such as those offered by Westours, provide

a glimpse of Denali. Adventure tour companies such as Mountain Travel offer backcountry hiking tours, while Wilderness Travel and Special Expeditions base groups at Camp Denali.

Everglades, Florida's River of Grass

If you go park-hopping in Florida, you'll find the watery landscape of Everglades National Park—called "river of grass" by the Seminole Indians—a subtle one. The treasures of its freshwater sloughs, hardwood hammocks, bayheads, pinelands, mari prairies, and mangrove swamps can best be appreciated by following land trails, boardwalks over the wetlands, and shallow boating channels.

Located at the tip of Florida, Everglades National Park embraces roughly 1.4 million acres of land and water, its boundaries enclosing the myriad islets, called keys, in Florida Bay, as well as the cluster called Ten Thousand Islands off Everglades City. One of its most unusual paths is the sign-posted 99-mile Wilderness Waterway running through the mangrove forests between Flamingo Visitor Center on Florida Bay and the Gulf Coast Ranger Station near Everglades City.

Otter, deer, crocodile and alligators, sea turtles, manatees, and the rare Florida panther are part of the wildlife mix, but birds—including roseate spoonbills, reddish egrets, and southern bald eagles—are undoubtedly the highlight.

- *Travel hints.* Winter is the most comfortable time to visit the Everglades. Miami International Airport is only 45 miles away, so the park can serve as counterpoint to Miami's beaches, Planet Ocean, the Cloud Forest domed equatorial garden, Little Havana, the Space Transit Museum, and the Art Deco Historic District.

Glacier, a Park Shared With Canada

Rocky Mountain geology doesn't recognize the nation's boundary, so in 1932 the United States and Canada agreed to designate Glacier National Park in Montana and Waterton National Park in Alberta, which join at the 49th parallel, as the International Peace Park.

Glacier/Waterton is high, rugged, and cold. Numerous peaks are close to 10,000 feet; some 60 glaciers still cling to the high country; and long, fingerlike lakes fill deep, glacier-cut troughs. Most of the park is accessible only by trail, some 900 miles of them. In Montana the remarkable Going-to-the-Sun Road, which is closed in winter, climbs and twists its way 80 miles across the park.

- *Travel hints.* Lodges and campgrounds can be found on both sides of the border, along with two backcountry chalets. The railway line swings south around the park, depositing passengers at East or West Glacier. If you use Amtrak's Empire Builder service between

Fireweed is one of the wildflowers visitors to Denali can enjoy. Photo by Robert Wolfson / Wilderness Travel.

Chicago and Spokane/Portland, you can purchase a six-day, five-night escorted Glacier Park tour along with your ticket.

Grand Teton's Photogenic Profile

Grand Teton National Park in Wyoming boasts a landscape to keep Kodak and Nikon rich and happy. The photographic lure is a 40-mile range of mountains that rise wall-like 7,000 feet above the floor of the valley called Jackson Hole. The wall is conveniently placed so the morning sun illuminates its face for early-rising photographers, while the sunset provides back lighting and roseate halos at day's end. First described by mountain men who came to trap in Jackson Hole, the Grand Tetons climax in the 13,770-foot summit of Grand Teton peak.

Although Grand Teton is often just a postscript to Yellowstone visits, the compact, 485-square-mile park has summer appeal for just about every park fan. The skilled mountaineer can base camp at Climber's Ranch. Walkers and backpackers have their choice of 200 miles of trails. Extended horseback trips are available, and rafting outfitters offer short Snake River trips. Fishermen have a choice of lake, river, and stream fishing. Birders can turn binoculars on species ranging from resident trumpeter swans to mountain bluebirds, and wildlife viewers may see moose, elk, mule deer, beavers, and porcupines.

Five campgrounds accommodate campers, while the Signal Mountain, Jenny Lake, and Jackson Lake lodges, as well as other facilities inside the park, provide beds for those who like conventional comfort.

- *Travel hints.* Many visitors to Grand Teton base themselves at lodges, hotels, motels, and dude ranches around Jackson, the little town at the park's south gate. Jackson itself offers a touch of high-country chic: The town square, which has four gates framed in cast-off elk antlers, is bounded by art galleries featuring big-

name Western artists and boutiques selling goods made by resident craftsmen. Symphony, theater, and an arts festival are all summer events. Grand Teton is often visited by excursions, such as Maupintour's National Parks of the Rockies, which also stops in Yellowstone and Glacier.

Madame Pele's Home on Hawaii

Sightseers were traveling to Kilauea volcano on the island of Hawaii long before Yellowstone was named our first national park.

Kilauea is said to be the home of Madame Pele, the Hawaiian goddess of fire. The volcano is the star of present-day Hawaii Volcanoes National Park, which sweeps from the sea on Hawaii's southeast coast to the summit of the 13,680-foot Mauna Loa volcano.

Kilauea is one of the world's most accessible volcanoes. You can hike into the caldera to the edge of Halemaumau firepit, and during eruptions watch the action from safe lookout points along the crater rim drive. You can visit the volcano's rifts, crossing deserts of black lava, ash, and pumice, and follow roads that end suddenly at lava walls. Or walk through old lava tubes, follow Devastation Trail through a ghost forest of dead trees in a cinder plain laid down in 1959, and then move from the lunar landscape into Kipuka Puaulu, a pocket of old forest spared by lava flows that is rich in native plants. Fern trees grow 15 feet high here, and the ohia-lehua tree displays blossoms as scarlet as Pele's fire.

- *Travel hints.* A look into Kilauea crater on a day trip can be a change of pace from diving, sportsfishing, golfing, and other facets of Kona Coast resort life. International Expeditions' tour includes a stay at Sheraton Volcano House, a descendant of the thatch hut that accommodated 1850s Kilauea vistors. While visiting other parts of Hawaii, you can keep tabs on eruption viewing possibilities by dialing (808) 967-7977 for recorded bulletins.

A World of Dunes in Indiana

Indiana Dunes National Seashore is new—dedicated only in 1972. It is small, embracing 12,000 acres of wetlands, beaches, woods, and dunes (the highest of these rising 190 feet) on the south shore of Lake Michgan. It is a park in a throrougly urban setting, with Michigan City on its eastern flanks and Gary to the west. Three steel mills are just beyond its boundaries.

This besieged pocket of wild lands represents 15,000 years of botanical and geological history commencing with the last ice age. It provided the inspiration for the science of ecology, which grew out of Henry R. Cowles' research into the varied flora, from Arctic to southern, growing here. For the amateur naturalist, the park means a thousand species of plants, including 26 members of the orchid family. For the birder, it means sightings of some 200 species.

• *Travel hints.* The park is 60 miles east of Chicago, so if that city is your summer destination for business or urban vacationing, you can quickly reach the park by car or on the South Shore and South Bend Railroad, which stops near the visitor center and other places convenient to park entrances.

North Cascades, A Mountaineer's Park

The most dramatic approach to North Cascades National Park in Washington is a sail on *The Lady of the Lake* from the south to the north end of 55-mile-long, glacier-cut Lake Chelan, and land travel from there up the Stehekin Valley into the park. Both lake and valley are giant glacial troughs.

The signature of North Cascades, a national park since 1968, is its rugged and wild glacier-cut valleys and jagged peaks, with 150 active glaciers. Virtually roadless, the North Cascades is the realm of the backpacker, horseback rider, and climber.

The park borders Canada on the north, and is cut in half by the Ross Lake National Recreation Area and Highway 20. The southern boundary of the south half is bordered by the Lake Chelan National Recreation Area, which embraces the last five miles of the lake. The village of Stehekin at lake head is accessible only by boat, floatplane, or trail. From there a gravel road leads up the Stehekin Valley, dead-ending at the foot of Cascade Pass some ten miles inside the park.

- *Travel hints.* Campers and backpackers are transported to primitive camps and trailheads in Stehekin Valley by park shuttle buses. Noncampers check in at the small North Cascades Lodge in Stehekin and use park shuttles for day excursions.

Lake Chelan's southern tip and the pleasant resort town of Chelan are but a few miles from the Columbia River. Those who want to sample the North Cascades National Park after other travel could take advantage of a Columbia River cruise offered by Exploration Cruise Lines.

Utah, a Choice of Five Parks

In the rush to reach Grand Canyon National Park, travelers often overlook the treasures of the high-desert world of southern Utah. Here you can roam five national parks—Arches, Bryce Canyon, Canyonlands, Capital Reef, and Zion—and if you're still not sated with scenery and high-desert country, you can add three national monuments—Cedar Breaks, Natural Bridges, and Rainbow Bridge—as well as the Glen Canyon National Recreation Area.

The landscape of these parks is one of sandstone eroded and scoured by rivers, rain, snow, and wind. Names like Rainbow Point, Fiery Furnace, and Pink Cliffs acknowledge red in all its variations as the dominant color. Candlestick Spire, The Wall, Chimney Rock, The Beehives, The Castle, The Needles, Molar Rock, and Silver Stairs suggest the fantastic form of the landscape. This country appears to be empty, but its canyons and mesas are home to deer, cougar, and desert bighorn sheep. Crumbling cliff houses, petrographs, and petroglyphs are reminders of ancient Indian settlements.

The Green and Colorado rivers meet in the center of the area's largest park, 337,570-acre Canyonlands. Wilderness rafting is possible here, as are hiking and backcountry tours by rugged vehicles that can navigate the steep, unpaved roads.

- *Travel hints.* Bryce Canyon and Zion have park lodges. The others have no-reservation camps. Ideal for the car and camper traveler, the five parks are accessible year round. In high-desert country, where elevations range from 5,000 to 9,000 feet, summer weather can be scorching by day, chilly at night.

The Virgin Islands, A Park With Coral Reefs

When Yellowstone was created, it would have seemed preposterous for a national park service to administer park protecting coral polyps. But today the U.S. Park Service does just that, and park naturalists regularly escort snorkeling tours along the reef off St. John Island, site of the Virgin Islands National Park established in 1957.

Virgin Islands National Park occupies about half of St. John, smallest of the three large islands comprising the U.S. Virgin Islands. The visitor center at Santa Cruz Bay

From its inception, the Sierra Club has championed national parks, lobbying to bring new ones into the National Park System and to ward off threats to them. Now it is helping to defend endangered parks around the world. When you visit these parks, learn what you can about their problems and let us know what you learn.

A visit to Daisetsuzan, with its volcanic peaks, provides a counterpoint to the antiquities of Japan. Photo courtesy of Japan National Tourist Organization.

is about 20 minutes by ferry from the western tip of St. Thomas Island. Park highlights for most visitors are the sign-posted, self-guided underwater trail through the reefs of Trunk Bay and Trunk Bay Beach, acclaimed as one of the world's best.

- *Travel hints.* You can camp or arrange for a cottage in the park at Cinnammon Bay, but if you prefer posh living, book into the Caneel Bay Plantation resort on St. John, or try a St. Thomas resort.

Daisetsuzan, a Park on Japan's Frontier

The big island of Hokkaido, where settlement began only a little more than a century ago, is popularly called Japan's frontier. Daisetsuzan National Park in the center of the island is the country's largest and wildest park. Established 50 years ago, it is one of the first parks in Hokkaido. The undulating, forest-cloaked Ishikari Highlands at the heart of the park are flanked to the north by ten old volcanic peaks called the Daisetsuzan group, all rising about 7,200 feet, and to the west and southeast by other volcanic clusters.

Although the heart of Daisetsuzan shelters vast stretches of primeval forest and fairly wild alpine country—rarities in Japan—it also contains features not commonly associated with national parks here.

Hikers commonly traverse the Daisetsuzan plateau between 6,600-foot Korodake (Black Mountain) and 7,513-foot Mt. Asahi by riding ropeways from spas at the base of each mountain, then following a trail that crosses areas rich in unusual alpine flora, with panoramic views of the Ishikari Plateau. The trail leads past the crater of Mt. Daisetsu, volcanic lakes, smoking fissures, and numerous small craters.

- *Travel hints.* Sapporo, linked with Tokyo by air or rail, is the takeoff point for touring Daisetsuzan and Hokkaido. A stop in Sapporo should include the Botanical Gardens and the Ainu Museum, devoted to the island's original inhabitants. Deemed "almost un-Japanese," Hokkaido, with its dairies, silos, and red barns, provides novel counterpoint to the antiquities of Kyoto and other parts of old Japan.

Rainforests, Fiords & Glaciers in New Zealand

The southwest corner of South Island in New Zealand boasts a quartet of national parks that embrace fiords, rainforests, glaciers, alpine country, lakes, and high

tussock grass country. The parks start about midway down the west side of South Island with Mt. Cook National Park and, adjoining it to the west, Westland National Park. Farther south are Mt. Aspiring National Park and Fiordland National Park, largest of the four.

Mt. Cook and Westland share the highest peaks and largest glaciers of the Southern Alps. The heart of Mt. Cook is, of course, the 12,349-foot peak by the same name. The 18-mile Tasman Glacier is its neighbor. In Westland, the Fox and Franz Josef glaciers follow a course from peak to rainforest that ends a few kilometers from the sea.

Mt. Aspiring National Park, crowned by 9,957-foot Mt. Aspiring, is called a mountaineers park. Fiordland stretches roughly 150 miles north to south, and boasts forests nourished by some of the heaviest rainfall on Earth, more than a dozen major fiords, glacier-cut valleys, and a chain of lakes.

Milford Sound is the favored destination for sightseers in Fiordland, and the Milford Track guided walk is the goal of hikers from around the world. Fiordland also offers hiking along lesser known tracks, such as the Hollyford Valley Track and the Routeburn Track (which commences in Glenorchy or the western tip of Lake Wakatipu), as well as excursions to Doubtful Sound, a 30-mile-long fiord some think excels Milford in beauty.

• *Travel hints.* Summer in the Southern Hemisphere is the high season for these parks, but some access to all four is possible year round. The Hermitage complex at park headquarters provides a base for Mt. Cook sightseers, hikers, and skiers. Fiordland visitors making the Milford Sound and Milford Track journeys travel from the village of Te Anau on Lake Te Anau to the Milford Sound Hotel, their base at the end of the road. Isolated Doubtful Sound, which has no hotel, is accessible only for day trips.

Exploration of South Island and its parks begins on arrival at Christchurch, a tidy city with a River Avon that is called New Zealand's most English city.

Sampling India's Sanctuaries

India's first conservation edict was promulgated 2,250 years ago when Emperor Asoka decreed that bats, monkeys, rhinoceroses, porcupines, and tree squirrels were to be protected. Moreover, he declared, "forests must not be burned, either for mischief or to destroy living creatures."

Modern India's conservation efforts focus on more than 200 parks and sanctuaries for some of the same animals, all threatened by dwindling habitat and human population pressure. One of India's best bird sanctuaries is only a few miles from the Taj Mahal. The Keoladeo Ghana sanctuary, once the swampy hunting preserve of princes, has one of the longest seasons in India. When the monsoon ends in mid-September, the sanctuary fills with nesting birds.

The Great Indian rhinoceros placed under Emperor Asoka's protection has dwindled to about 1,000 head, all gathered in swamp and forest preserves in the state of Assam in northeastern India. From February to May, visitors to Assam's Kaziranga ride forth on elephants to view the rhinos. Swamp and hog deer, wild pig, lesser adjutant storks, and ring-tailed fishing eagles are also present, and the track of tiger is sometimes seen.

• *Travel hints.* New Delhi, India's capital, is the jumping-off point for any circuit of subcontinent sanctuaries. Agra, the Taj, and Keoladeo Ghana are all a day's drive from Delhi. Kaziranga in Assam is an easy side trip for visitors going to Darjeeling or Sikkim in the Himalayas. Mid-September through February is generally the best time for most sanctuaries, and independent visits are easily arranged once you're in India.

SIERRA

Parks & Places

For more information from these *Sierra* advertisers, please circle the appropriate number.

1. BritRail Pass
2. Exploration Holidays and Cruises
3. Furnace Creek Inn and Ranch Resort
4. Grand Canyon National Park Lodges
5. International Expeditions
6. Jackson Hole Area Chamber of Commerce
7. Journeys International
8. Maupintour
9. Montana Department of Commerce
10. Mountain Travel
11. New Zealand Tourist & Publicity Office
12. Outdoor Products
13. Wilderness Travel
14. Yosemite Park & Curry

Please print or type

1. Handling fee (Orders without handling fee cannot be processed) $ 1.00

Name _____

Address _____

City _____ State _____ Zip _____

Do not use after **May 31, 1986** **TRAVEL 1986**

Make checks or money orders payable to *Sierra* Magazine

Send reply card with payment to:

Sierra Magazine
Reader Service Management Dept.
P.O. Box 375
Dalton, Massachusetts 01227-0375

HOW TO USE THIS FAST ACTION FORM

To receive information from an advertiser listed on the reverse side, circle the appropriate number on the reply card and enclose your check or money order made payable to *Sierra*. Orders without the handling fee of $1 cannot be processed. Don't forget your name and address. Allow six to eight weeks for delivery of most items.

Mail the reply card and your remittance in an envelope to:

Sierra **Magazine**
Reader Service Management Department
P.O. Box 375
Dalton, Massachusetts 01227-0375

A Wild Corner of Switzerland

Because the European landscapes seen by most Americans are so thoroughly domesticated, it may come as a surprise to find a park where, according to a guidebook, "no cattle may graze, nor trees be felled; the forests remain untouched, and shooting and the picking of flowers are forbidden." Such a place is the Swiss National Park.

It had its beginning in the first decade of the 20th century, when the Swiss Society of Protection of Nature acquired 5,000 acres on the Engadine in the Grisons adjoining the Italian border. The government formalized the work in 1914, and today the park is eight times its original size.

Peaks here are very steep, and cleft by fissures. Valleys are wild, and the original forests of spruce, larch, and cembra pine—undisturbed since the park's founding—cover slopes to 7,550 feet. Wildflowers, many found nowhere else in Switzerland, are at their peak in mid-June. The once-endangered ibex thrives here, as do the chamois, roe deer, and red deer.

• *Travel hints.* Swiss National Park has its share of the country's 30,000 miles of marked trails, and trail guidebooks are readily available if you want to make independent day and half-day hikes here. Guided excursions can also be arranged. There's no camping in the park; inns and hotels provide bases for hikers. Switzerland's excellent road and rail system make it possible to include the park in almost any circuit of the compact country. Nature tour operators (Questers Tours & Travel, for instance) often include the park in their itineraries.

The Great Indian rhinoceros now lives in Assam's Kaziranga sanctuary, having dwindled in number to about 1,000 head. Photo by Shirley Fockler.

Spain's Great Wetlands

The 100,000-acre Coto Doñana National Park is between Seville and the sunny Costa de Luz, in wetlands watered by the Rio Guadalquivir delta. Once the hunting preserve of aristocrats, it is considered one of the last great wetlands in Europe. Because it is on a major flyway between Europe and Africa, it is an important sanctuary for migrating birds, and a rookery for flamingos, herons, and egrets. Deer and wild boar are residents of the savannas.

• *Travel hints.* Independent travelers visiting Seville or staying on the coast can arrange half-day excursions to the sanctuary via eight-passenger Land Rovers. The trips, arranged through ICONA in Huelva, depart twice daily except on Sundays and holidays. Nature tour operator Questers

Tours & Travel includes the park in a Spanish tour focused on spring wildflowers and birds.

A Park in Scotland's Highlands

Hikers wandering the highlands of Scotland are inevitably drawn to the Cairngorms, where a half dozen peaks topping 4,000 feet form the highest mountain mass in Britain. The Cairngorms Nature Reserve, Britain's largest, spreads over 100 square miles of the range.

The name Cairngorms gives a clue to the geology of the mountains, cairngorm being an ornamental yellow or brown quartz found here. The plateau of the Cairngorms shelter small, cold lochs (lakes) and arctic-alpine vegetation. Farther down are heather moors and bogs. Trails are frequently old drover (herding) roads. The reserve is home to red deer, and ptarmigan are common.

- *Travel hints.* Cairngorms, located between Aviemore in the Spey valley and Braemar on Deeside, is an easy addition to the castle/museum/whisky distillery/Loch Ness monster circuit followed by travelers in Scotland. The Central Highlands are easily accessible by BritRail.

A Sierra Club Traveler's Bookshelf

A unique five-volume series, *The Sierra Club Guides to the National Parks*, offers the most comprehensive guidebooks to all 48 national parks. Illustrated in color, each provides background on history, geology, and natural features; information on trails, activities, and facilities; maps; and an appendix of the plants and animals found in each park.

While they provide basic information on transportation, food and lodging, *The Sierra Club Adventure Travel Guides* emphasize the outdoor recreational opportunities in some of the world's most popular and scenic regions. The four new guides released this spring cover the Grand Randonnée Cinq (GR-5), Europe's 1,500-mile equivalent of the Appalachian Trail, running from the North Sea to the Riviera; the Rocky Mountains of the United States and Canada; the Gulf Coast, from the Florida Keys to the Yucatan; and a guide to the European Alps. These complement previously published guides to the Andes, Alaska, and the Himalaya and Karakoram.

For more information, write Sierra Club Bookstore, 730 Polk St., San Francisco, CA 94109.

Grand Teton National Park features 200 miles of trails against a backdrop of spectacular scenery. Photo courtesy of Wyoming Travel Commission.

That's him in the photos!

That's our Harry Bright, New Zealand's Advertising Manager down under, taking the tour of New Zealand rather splendidly.

And apparently not taking the advertising of New Zealand very seriously.

It's starting to look like Harry's wife Eloise is the only Bright doing any sending these days. But, look here, we do appreciate her posting these Kodaks to us.

After all, they're rather graphic proof of at least two things:

Harry's diminished enthusiasm for getting down to business on our long-overdue ad.

And, if we do say so ourselves, New Zealand's undiminished beauty.

Do keep those snaps coming, Eloise!

(New Zealand. So much to advertise. So many perfectly splendid reasons not to.)

Send me all those New Zealand "goodies" Harry hasn't gotten around to sending you yet.

☐ The New Zealand Book plus our catalogue of New Zealand vacations in colour!

☐ 18 minute New Zealand video cassette (VHS) free from our lending library. SR-203

Name_____

Address_____

City/State/Zip_____

New Zealand Tourist & Publicity Office, 10960 Wilshire Blvd., Suite #1530, Los Angeles, CA 90024. NZP

New Zealand

Good Better Best

Getting ready to buy a Day Pack? If so, don't settle for one that's just *good* enough to do the job (it may come apart at the seams) or one that you think might be a little *better* (because it costs more)—reach for the ***BEST*** American-made day packs money can buy! Outdoor Products.

Why do we feel ours is the best? It's simple. We make our packs (and all our other products as well) with the finest quality materials available. We build in the features you most often ask and look for, plus we back each and every product up with a LIFETIME GUARANTEE. Best of all, our packs won't cost you a bundle.

Hike on down to the dealer nearest you and reach for Outdoor Products. . . you'll never have to settle for second best again!

Shown: Popular Deluxe Sierra Pack #424 featuring rugged 1000 Denier Cordura® construction, full-grain reinforced leather bottom and 3 lash tabs, Fastex buckles and hardware, extra-wide padded shoulder straps, handy carry and axe loops, and self repairing nylon coil zippers throughout. Wt. 21 oz., 6" D × 13.5" W × 19" H. Vol. 1420 Cu. in.

Outdoor Products

LIFETIME GUARANTEE

"American Quality You Can Afford"

533 So. Los Angeles St. Los Angeles, CA 90013

CORDURA®

Cordura® is a registered trademark of DuPont Corp.

SUPERFUND 1985

THE ANATOMY OF A SIERRA CLUB VICTORY

DOUGLAS SCOTT

LAST FALL WAS an unusually hectic—some would say chaotic—time in the U.S. House of Representatives. Intense, highly publicized battles raged over the federal budget, the Gramm-Rudman deficit reduction plan, and the tax reform bill.

Amid the pushing and pulling over these issues, the House passed a strong bill to renew, strengthen, and greatly expand the national Superfund program for cleaning up abandoned toxic waste dumps. The December 10 vote on the Superfund Amendments of 1985, a bill enthusiastically supported

December 10, 1985

The House Superfund vote was a joyous occasion for Representatives James Florio (D-N.J.), Robert Roe (D-N.J.), and Robert Edgar (D-Penn.), who celebrated with citizens at the Sierra Club's Washington, D.C., office. The odds against passage of a strong House bill looked overwhelming last summer. But a groundswell of support for swift, effective cleanup of abandoned toxic waste dumps dramatically altered 1985 Superfund politics. Next, House and Senate versions of the bill will be reconciled by a conference committee.

Florio Roe Edgar

Illustrations by Hubert Hannah

by the Sierra Club, was 391 to 33.

That evening, three blocks from the Capitol, the Sierra Club's Washington office was the scene of a long, exuberant party. So intense was the celebration that when the House passed the key strengthening amendment by a one-vote margin, plaster fell from the ceiling in the delicatessen one floor below.

Superfund was not the Sierra Club's only victory in Congress last year. But in terms of substance and political impact, the passage of a strong Superfund bill by the House was 1985's most significant event in the politics of the environment.

As Congress began its August 1985 recess, it appeared that the Sierra Club and other groups working for a strong Superfund law had suffered a total, humiliating defeat. Some Washington observers even concluded that Congress had turned against environmentalists.

In an early July item entitled "Environmentalists Lose Ground in Legislative Battles," *The Wall Street Journal* said, "A House panel rejects [environmentalists'] 'Superfund' toxic-waste cleanup bill. Proposed controls on chemical-plant leaks run into tough opposition. . . . Energy Committee member Rep. [Dennis] Eckart, an Ohio Democrat, contends the problem is that Congress has turned right."

In mid-September the *National Journal*, a respected observer of Washington events, reported that in the 1985 Superfund battle "the environmentalists so far have failed on many of their major goals."

Yet even as that article was being read all over Washington, Sierra Club volunteers were working in hundreds of towns and cities nationwide to reverse these defeats. The story of this reversal and ultimate victory illustrates the political power that can be mobilized by intensive, carefully focused grassroots work—the backbone of the Club's lobbying method.

The Superfund program initiated by Congress in 1980 has hardly been a stellar success. President Reagan virtually condemned the fledgling program to failure by putting it in the hands of the EPA's Anne Burford and Rita Lavelle. By the time the initial five-year, $1.6-billion program came up for reauthorization in 1985, only six dumps had been cleaned up (see "Superstakes," page 55).

A year before, the House had already passed a new five-year Superfund bill. Few representatives wished to cast a vote against the environment on the eve of their 1984 re-election campaigns, so the $10-billion bill, with strong new provisions to accelerate the cleanup of abandoned hazardous wastes, passed the House by a vote of 323 to 33. The Senate did not act on the legislation, however, and the process had to begin again with the new Congress in 1985.

The author of the successful 1984 legislation, Rep. James Florio (D-N.J.), introduced a new bill based largely on the 1984 version. It was enthusiastically supported by the Sierra Club, the National Audubon Society, the League of Women Voters, and other organizations.

The bill should have had clear sailing through the subcommittee chaired by Florio as well as the full House Committee on Energy and Commerce, which had approved the 1984 version by a 38-to-3 vote. On June 20, however, Florio's subcommittee flatly rejected his bill, substituting one introduced by Rep. Eckart but conceived by the powerful committee chair, John Dingell (D-Mich.), and the senior Republican committee member, James Broyhill of North Carolina. In July the Dingell-Broyhill bill was approved by the full committee, this time by a vote of 31 to 10.

"How the committee changed direction so sharply is a complex story of ambition, national politics, internal congressional maneuvering and, at every turn, heavy and persistent lobbying," the *National Journal* reported. The chief lobbyist for the Chemical Manufacturers Association explained that election year "political forces" had swayed the House vote in 1984, but "those forces aren't there this year, and that is why the debate has moved differently."

Environmentalists were furious. Following Eckart and Dingell's lead (both had been advocates for the stronger bill a year earlier), most of the committee members had abandoned the principles of the 1984 bill to support the weaker Dingell-Broyhill version.

In the aftermath of this reversal, the volunteer leader of the Club's Superfund campaign, Doris Cellarius, met with A. Blakeman Early, the Club's toxics lobbyist, and other environmental leaders to weigh the possibility of mounting a successful emergency effort to overturn the committee's decision. The prospects were daunting indeed.

"It was very discouraging," says Cellarius, "not because of the issues; we knew we had the facts on our side. But because of the politics."

The Dingell-Broyhill bill enjoyed the support of an overwhelming majority of the En-

July 1985

At the heart of the Club's lobbying effort were low-profile but proven techniques, such as writing letters and making telephone calls to key members of Congress. "The campaign was an immense amount of work," activist Diane Walker of New Jersey recalls, "but I'm proud that we decided to do it."

ergy and Commerce Committee. It had a bipartisan image, although the ten dissenters on the committee were all Democrats. The chief advocate for the weak bill, John Dingell, is a respected (some would say feared) senior member of the House. His bill had the enthusiastic support of the Reagan administration and its political appointees at the Environmental Protection Agency. Chemical industry lobbyists liked the bill, but were working for amendments to weaken it even further. Meanwhile, the Senate was also in the process of passing a Superfund bill that was as weak as or weaker than the Dingell-Broyhill bill.

Capitol Hill observers didn't think conservationists had a chance. Nonetheless, the Sierra Club and other groups were determined to fight back, for only if the House passed a strong bill would the new Superfund be adequate. There was strong public support for swift, effective action to clean up toxic wastes. It was clear that in many ways the House Energy and Commerce Committee had fallen increasingly out of step with the temper of the public and the House as a whole on environmental issues.

Essential to environmentalists' hopes for success was the full House vote for a strong Superfund bill in 1984. Two hundred ninety-seven of the 323 representatives who had voted for the previous bill would be voting again in 1985. Eckart and Dingell were essentially asking each of them to reverse their earlier vote, while the Sierra Club was only asking them to vote for the same kind of strong bill they had passed before.

The Sierra Club soon devised a strategy in which it had considerable confidence: mobilizing the power of its members in every pivotal congressional district, and in a more thorough and intense way than ever before. The stakes were that high. As Diane Walker, the Club's New Jersey conservation chair, put it, "This is something Sierra Club people all over the country care deeply about. We may not all live near dump sites, but we have a neighborly feeling toward those who do."

"Strategy" is an often overworked term in legislative fights. Too often, well-intentioned people get so enthusiastic about looking ahead and planning for a whole chain of increasingly im-

SUPERSTAKES

IN THE DEBATE over reauthorization of the Superfund, most of the media and many members of Congress have followed the most easily understood issue—how much money the program will get, and which taxing formula will be used to pay for it. But those who dwell on the funding issue are missing an essential point. Adequate funding alone does not ensure effective cleanup of the nation's abandoned toxic waste dumps. Also needed are mechanisms to force the EPA to take action.

For five years the EPA has been responsible for cleaning up these sites. Yet only six cleanups have been certified as completed—and community observers feel that most of these are not truly cleaned up. Almost no progress has been made toward implementing the only permanent solution to the problem: treatment and detoxification of the chemicals at abandoned waste sites. Meanwhile, the number of sites needing attention has soared.

Even in the face of this evidence, the Reagan administration has continued to insist that it cannot move faster or more aggressively. The EPA has opposed the establishment of uniform cleanup standards for hazardous waste sites and has continued to approve cleanup plans that leave dangerous wastes in place, untreated.

To those following only the funding issue, the Dingell-Broyhill bill that emerged from the House Energy and Commerce Committee on June 20 may have looked acceptable: It called for the same $10-billion, five-year program that environmentalists had set as an acceptable minimum. But it did not contain any of the critical action-forcing mechanisms the House had supported in 1984.

Nor did it contain enforceable schedules, leaving the timing of cleanups to the EPA and the Office of Management and Budget (OMB), which has repeatedly demonstrated that it favors a modest, slow-moving program. And the bill contained no uniform standards, leaving the EPA free to approve cosmetic or temporary cleanup plans. Worse, this allows the OMB to pressure the EPA to choose the cheapest possible alternatives.

By failing to give citizens the right to sue the parties responsible for waste dumps, the Dingell-Broyhill bill would also have left localities powerless to do anything about the sites that have not received attention from the EPA.

An adequately financed Superfund is essential. But by fighting the crucial policy issues and defending the need for action-forcing mechanisms, the Sierra Club campaign helped pass a House bill that would guarantee that the EPA will be held accountable for effective use of its authority.

Having achieved this, environmental lobbyists are now focused on the conference committee that will reconcile the House and Senate versions of the bill—a process expected to last through the spring. If environmentalists can hold on to the gains won in the House, the American people will have a bill that could protect us all from leaking hazardous waste dumps.

probable contingencies that they are blinded to the need for organizing real political power.

"Power" is another troublesome word. The Club's power derives not so much from its lobbyists' connections with movers and shakers, but from the activism of volunteers in every congressional district. When they are organized and active on an issue, constituents can have a unique kind of clout. Individual letters and phone calls from back home can really make the difference in how a representative votes.

Carrying out the Club's strategy involved a multitude of activities. Mass mailings were dispatched—ultimately hundreds of thousands of pieces to every Club member in more than 200 key congressional districts. Volunteer congressional-district coordinators worked closely with field staff to tailor a plan to influence each key representative. Volunteers initiated all manner of local efforts—building local coalitions with other groups, organizing members to study the issues and their local implications, pursuing contacts with local reporters, editorial writers, and other media, and arranging for well-informed constituents to meet with each representative when he or she returned to the district.

Meanwhile, in Washington and San Francisco, the Club worked to produce detailed lobbying materials on each of the complex issues involved in the Superfund debate. These included an elaborate 22-page spreadsheet that compared each provision of the Dingell-Broyhill bill with its stronger counterpart in the 1984 bill. Copies of these documents went to each member of Congress and to hundreds of local Sierra Club leaders.

To keep Club leaders informed, a special bulletin was created. Each week for 20 weeks, *The Superactivist* provided timely information, inside political angles, and a host of suggestions. The rush to write, print, fold, and mail hundreds of copies soon became a weekly routine for the conservation staff in San Francisco.

November 1985

As the congressional debate grew more heated and complex, Sierra Club volunteers flew to Washington, D.C., to lobby. Before the battle in the House of Representatives was over, some 150 Club members had collectively made thousands of visits to legislators and their staffs on behalf of a strong Superfund.

In Washington, squads of Club volunteers spread out across Capitol Hill to lobby. Before it was all over, more than 150 volunteer leaders had each spent a week in Washington, visiting representatives and their staffs.

To complement the growing tide of grassroots opposition to the Dingell-Broyhill bill, Club leaders worked on changing the widely held assumptions that the bill had broad bipartisan support in Congress, and that the Sierra Club was an underdog squaring off against a powerful House committee.

Because it is so complex, the Superfund legislation comes under the jurisdiction of many House committees, not just Energy and Commerce. Among these is the Committee on Public Works and Transportation, which has jurisdiction over all water pollution issues. The bill had to pass through this committee before it could reach the House floor for a final vote.

Working on the Clean Water Act earlier in the year, Club lobbyists had established good rapport with the leaders of the Public Works Committee, and began meeting with them in July, urging them to draft a much stronger version of the Superfund bill and pledging all-out support if they did.

Democratic Representatives James Howard and Robert Roe, chairs respectively of the Public Works Committee and its Water Resources Subcommittee, both come from New Jersey, the state with the highest concentration of abandoned toxic dumps. Thoroughly familiar with the problems of the Superfund program, they were not sympathetic to the way Dingell's committee had abandoned the 1984 bill. They went to work to write a stronger bill and marshal the support of a majority of their committee.

Led by the Sierra Club, environmentalists went to work too. Special "write your representative" mailings were dispatched to Club members in the districts of each member of the committee. Phone banks were organized by Club chapters in these states to ask that letters and phone calls pour in to committee members. Club volunteers from key districts came to Washington to lobby.

Responding to the growing support for a stronger Superfund bill, Rep. Roe —one of the heroes of this long fight— drafted an excellent new Superfund bill, based largely on the strong provisions of the 1984 bill and breaking sharply with the positions taken by Dingell's committee. He and committee chair Howard won the support of their committee members, who passed the Howard-Roe bill by a voice vote.

This event—supported by a massive mobilization of letters and phone calls from constituents—changed the political complexion of the House fight. A powerful House committee was now championing the environmentalists' side, offering a clear alternative to the

Energy and Commerce Committee's bill. The new bill had bipartisan backing, including the faithful support of one of the committee's senior Republicans, Rep. Arlan Stangeland from Minnesota. Recognizing that the wind was beginning to blow in a different direction, House members who had been sitting on the fence began to warm to the Howard-Roe position.

To attract even wider support, the Club needed a way to demonstrate the growing momentum of the Howard-Roe bill. Supported by environmental lobbyists, Reps. Bob Edgar (D-Pa.), Tim Wirth (D-Colo.), and Tom Downey (D-N.Y.) authored a letter addressed to both the Speaker and the Republican leader of the House, urging adoption of a stronger Superfund bill. Sierra Club leaders around the country asked their representatives to co-sign. Not only did staunch environmental supporters sign, so did a growing number of swing representatives—real evidence of momentum building in the Club's favor. Ultimately, 136 House members of both parties, or nearly one third of the House, co-signed this document. Scores of others gave Club lobbyists their private commitment.

Their position thus undercut, Dingell, Eckart, and their supporters had no choice but to negotiate with Public Works Committee leaders on a compromise bill that would go to the House floor. In negotiations that continued through the Thanksgiving recess, the leaders of the Public Works Committee had the stronger hand, thanks to long months of persistent district-by-district grassroots work by Club activists. As the *Weekly Bulletin* of the Environmental and Energy Study Institute (EESI) reported, "The compromise incorporated most of the provisions environmentalists sought."

It was that compromise bill, patterned after the Howard-Roe bill on most of the key issues, that went to the House floor in early December. As the time to vote approached, the national field staff of the Sierra Club was called to Washington. Registered lobbyists all, they focused their efforts on the undecided representatives. Between office visits they sent word back to their district coordinators.

In a way, the actual floor debate seemed anticlimactic. Every effort at introducing weakening amendments was defeated, and a series of strengthening amendments approved. The key vote came on an amendment by Reps. Edgar and Gerry Sikorski (D-Minn.) requiring that local communities be informed of emissions of certain chemicals that cause chronic health problems. The Edgar-Sikorski amendment was adopted by a comfortable 183-to-166 vote during the first day of debate, but after an intense weekend of lobbying, Dingell and his chemical-industry and administration allies made an effort to defeat the amendment on "reconsideration." Changes of votes by several representatives led in the final seconds to a one-vote victory for environmentalists, 212 to 211. That's when the plaster fell from the deli ceiling.

NEWS REPORTS and Capitol Hill newsletters hailed the House Superfund vote as a major victory for the environmental movement. "The House bill represents a come-from-behind victory for environmental groups, which all year had contested EPA and industry on Superfund issues," reported the EESI's *Weekly Bulletin*. Less visible to many of these observers was the extraordinary work by Sierra Club leaders and other environmentalists back home in each of the important congressional districts.

Because 1985 was not an election year, the chemical industry lobby had felt confident of being able to reverse the 1984 House vote. Seduced by other ambitions, Eckart and other representatives thought they could abandon their earlier support for a strong bill and lead the House in a broad retreat on the issue of toxic waste cleanup. But the average House member—made well aware of the grave public concern and intense political significance of their votes by the work of Club activists back home—chose not to retreat with them.

Environmental leaders have redoubled their confidence in the political power of grassroots lobbying, and their allies in Congress share that recognition. The Club has also made many new friends who will join willingly in future efforts.

Superfund campaign leader Cellarius points out another important gain. "We know what we need to act quickly: the phone trees, the local media connections, the relationships with technical experts, legal people, and congressional staff. Everybody is better organized."

This is an important legacy of the fight by each Sierra Club member who played a role, large or small. Individually and as an organization, we have stretched ourselves, learning important new approaches and deepening our political skills. These are lessons and skills we can apply again and again. ■

***Douglas Scott** is Director of the Sierra Club's Conservation Department.*

December 1985

When a December issue of The Superactivist *declared "The End is Near," most activists were ready. Every week seemed to bring a new challenge in the exhausting five-month campaign—the most intensive grassroots effort ever mounted by the Sierra Club.*

CULLMANN


Model 2503 with removable column for use as a unipod.

AN INVESTMENT IN STABILITY THAT WILL SHARPEN YOUR PHOTOGRAPHIC IMAGES.

1 Quik-Release System. A platform (Lower) mounted on the tripod securely holds flat coupling plates (Upper) attached to cameras and accessories.

2 Center Column Clamp. It permits stepless height adjustments and acts as a brake to keep the column from sliding down suddenly under the weight of the camera.

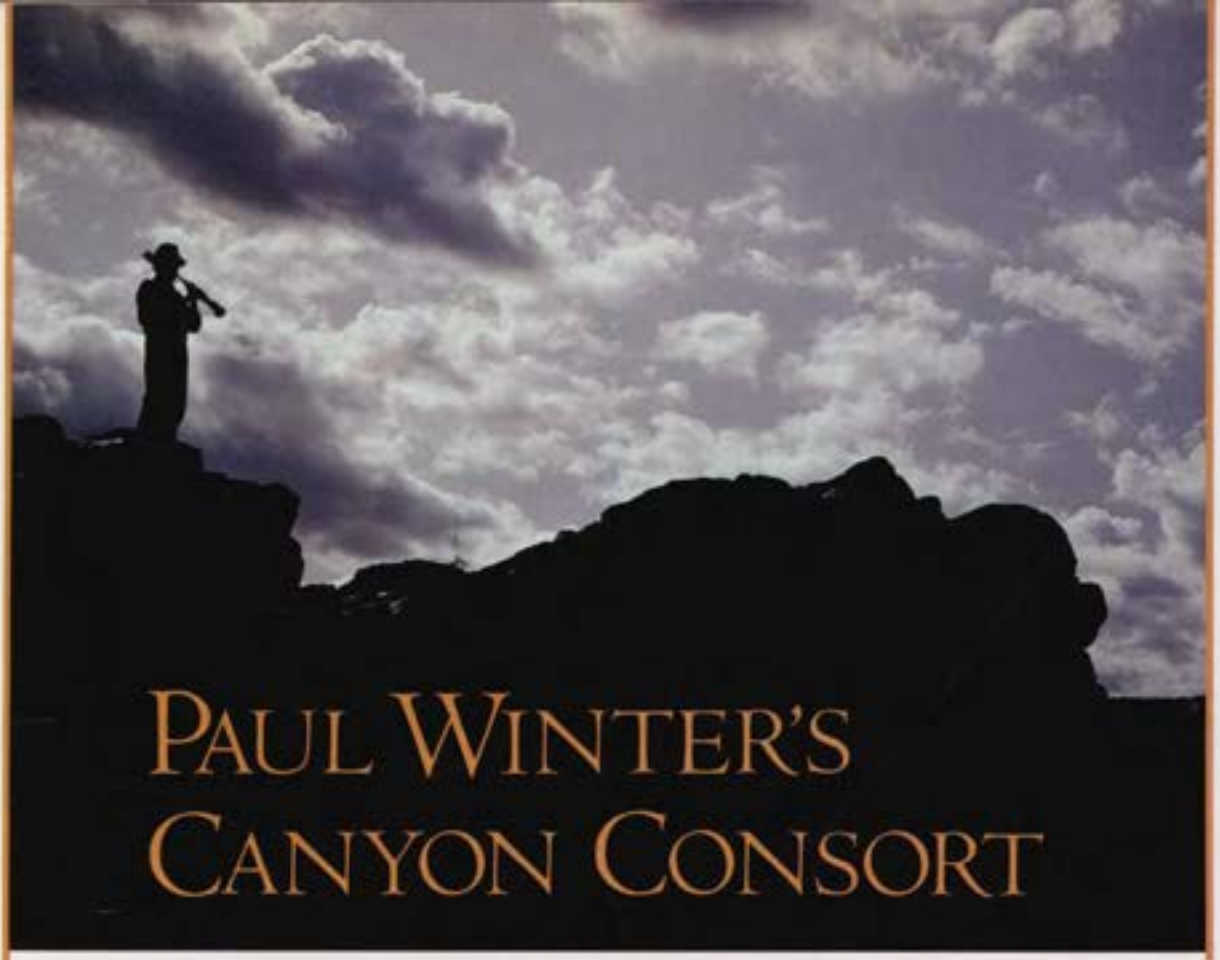
3 Three-Way Pan Head. For horizontal and vertical panning and sideward tilts. Needle bearings and visco-elastic lubricants create a "fluid effect" for easy movements.

4 Trapezoidal Telescoping Legs. (Right) Made of anodized extruded aluminum, they reduce weight and provide extra rigidity. Quick-Locks for one-handed operation. Combi-Feet (Left) swivel to steel teeth for outdoor use.

Cullman tripods are camera platforms of unparalled stability, and can hold a surprising amount of equipment precisely where it is needed. They are the finest examples of German engineering and craftsmanship. Choose from 12 models, plus unipods and a light stand, all backed by a five year guarantee. A full range of accessories are available for still and video photography. Tripod shown is Model 2503 with removable center column for use separately as a unipod. Write for a complete brochure and the name of your nearest dealer.

MADE BY CULLMANN · WEST-GERMANY · 5 YEARS GUARANTEE

GMI Photographic, Inc.,
Dept. S-3 P.O. Drawer U, 1776 New Highway,
Farmingdale, NY 11735 • (516)752-0066



PAUL WINTER'S CANYON CONSORT

Paul Winter breathes life into John Wesley Powell's description of the Grand Canyon as "the land of music."

Text and Photos by
STEPHEN TRIMBLE

STILL, OTHERWORLDLY, and difficult, countersunk into the vast Colorado Plateau, the Grand Canyon carves through 279 miles of northern Arizona. No one expects what they find here, and no one forgets what they see.

For more than ten years Paul Winter has come to the Grand Canyon with his soprano saxophone. He has stood on the rim at Shoshone Point and played to cliffs that send back a triple echo; improvised with his consort of musicians in the side canyons; and floated down the Colorado River.

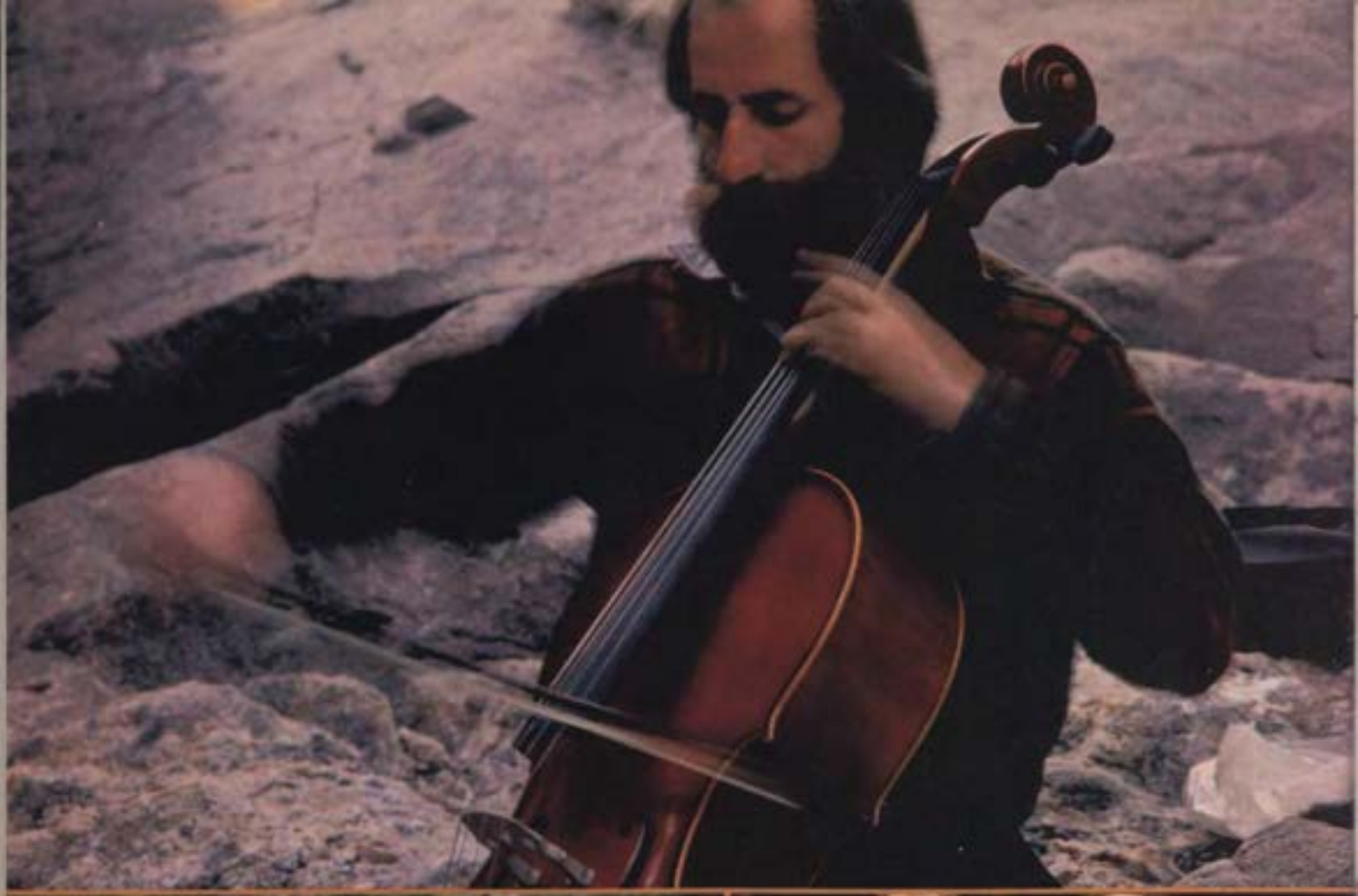
If it is naive to expect to understand the Grand Canyon, it is presumptuous for a musician to feel he can know this place well enough to make what could be called Grand Canyon music. Presumptuous—and yet Winter found something valuable here. "I felt put back together on the river," he says, "and I wanted to make music from that place. I wanted to make music of the canyon rather than just about it." The result is *Canyon*, a record album released on the Living Music Records label in 1985.

Even when nonmusicians come to these great spaces, they want to fill the stillness with sound. John Wesley Powell, first to describe the experience of a river trip through the canyon, wrote in 1895: "The wonders of the Grand Canyon cannot be adequately represented in symbols of speech, nor by speech itself . . . . It is the land of music."

April 29, 1983: Paul Winter's third river expedition nears its halfway point. We camp at Blacktail Canyon, and in small groups invade the little side canyon leading to the Colorado River. We are an expedition of musicians, film crew, recording engineers, photographers, directors, producers, managers, graphic designers, boatmen, financial backers, and support crew. I have come along as editor of the booklet that will accompany the new album.

Eugene Friesen sits with his back to a boulder, sending arpeggios from his cello downriver, over breakfast sizzling in cast-iron pans. Recording specialists Mickey and Judy Houlihan retreat to their tent with Winter and Steve Silverstein to listen to tapes from the evening before. Last night, Silverstein and Mickey Houlihan stayed late in an alcove up in Blacktail Canyon, recording Silverstein's Japanese wood flutes, improvisations in answer to the local chorus of canyon tree frogs.

I follow the film crew's sound man up Blacktail. With his directional mike attached to a short boom, listening this way and that, Curtis Choy



A landmark collaboration by the heads of the 10 leading American environmental organizations addressing the crucial national and international issues affecting our planet.

Yes, please send me _____ copy(ies) of AN ENVIRONMENTAL AGENDA FOR THE FUTURE, written by the leaders of America's 10 leading conservation organizations. I appreciate the low price of $6.95 including $1.00 for postage. Allow 4–6 weeks for delivery.

Name_____

Address_____

City_____

State_____ Zip Code_____

☐ Payment Enclosed_____ Total Amount ($6.95 each)

Maryland residents add 5% sales tax

Please charge my ☐ VISA ☐ MASTERCARD

Card Number_____ Exp. Date_____

Cardholder's Signature_____

ISLAND PRESS is a nonprofit press dedicated to the distribution and publication of books for professionals and concerned citizens in the natural resource conservation/environmental field. You can help ISLAND PRESS do its job by providing the following information.

Please indicate your 3 primary areas of interest.

1. Soil ☐
2. Water ☐
3. Hazardous Waste Management ☐
4. Land/Parks/Urban Open Spaces ☐
5. Agriculture ☐
6. Wildlife ☐
7. Forests ☐
8. Energy ☐

You are

☐ a professional in conservation and/or are
☐ an active participant in conservation organizations.

Thank You

☐ Please send me the new ISLAND PRESS catalog. It's free.

5

"AGENDA . . . addresses the most serious questions about the future of our resources."
Senator John Chafee

"Recommended to all my colleagues . . ."
Congressman Edward Markey

"AGENDA . . . an extremely valuable tool."
Robert Redford

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 15715 WASHINGTON, D.C.

Postage will be paid by

ISLAND PRESS
P.O. Box 53406
Washington, DC 20009

looks like an alien being with long antennae, searching for something in the soft air: prey, the scent of a mate.

He talks into his mike in a soft voice, footnoting each few seconds of tape: "Take One: a place called Blacktail Canyon, closeup of a bubbling brook. Take Two: conventional bubbling brook . . . . Take Six: the resonant ambience of a chamber 25 to 60 feet wide. . . ."

Beneath the bubbling of the brook rumbles the ambience of Take Six, the sound of the canyon breathing, the sound of wind gods blowing across the top of Blacktail Canyon like a breath of air across the top of a soda bottle.

Tapeats sandstone forms the walls of Blacktail, but at the canyon floor the stream cuts down to Vishnu schist, rock almost 2 billion years old. The musicians come up the canyon and lay their instrument cases down on this rock in a small alcove at a bend in the creek.

PAUL WINTER, soprano saxophone; Eugene Friesen, cello; Steve Silverstein, flutes; Paul Halley, music director at the Cathedral of St. John the Divine in New York City, who here plays a harmonium, a small foot-pedal organ. Glen Velez, the percussionist, uses frame drums that look like sophisticated tambourines: the *pandereta* from Spain, the *bendir* from North Africa, and the Azerbaijani *gaval*.

A raven arrives just as the consort sets up: glossy-black feathers perched high on a ledge. The musicians break into "Bye-Bye Blackbird." Early on in Winter's conception of the album, he linked the musical journey with that of a raven. But he hopes that "a listener can be moved by the music, resonate with it, without knowing anything about the canyon, about ravens, or why we did the album. It has to work as pure music; the images triggered by the music happen inside the listener."

Mickey Houlihan joins us and sets up the sound equipment. He protects his mike with a homemade windscreen, a spiderweb of steel rods covered with a silk dropcloth. We must tape early to avoid the sound of planes; even so, many of the tapes are interrupted by the engineer's voice: "Cut for airplane."

I sit on a ledge just downcanyon. This trip has heightened my auditory sense: I see the canyon with my ears. The creek is noisy—a high-pitched bubble to my left, a throatier bubble to the right. Upstream the saxophone calls, sounding like a bird spirit—first raven, then great blue heron, and finally pure, disembodied flight. The deeper notes from Velez's drum mix with thunder from the gray sky visible above the canyon only as a jagged curve of storm. Softer notes from the drum resemble the whine of violet-green swallows sailing by. Friesen's cello sings above all these sounds.

The consort plays for hours. They improvise. They play the "Silver Grotto Birthing Song" and Velez's river piece, a lovely repeating rhythm patterned after the roller-coaster waves in Hermit Rapid. From these many hours come a few minutes of music that really catch fire; these appear on the album on a piece recorded in New York City. "We can make better music from the instincts that become available to us here by improvising than we can by composing," says Winter.

Half the album comes from recordings in the Cathedral of St. John the Divine, the consort's musical home in New York. Winter equates the two spaces: "Both have the same sense of majesty, the same seven-second reverberation felt by a musician improvising with eyes closed.

"Music is a funny medium," he adds; "it's very hard to be literal. Here in the canyon we intend to create music on a particular day about a particular place, or about how a raven moves, or about the river—and often it won't sound like the canyon at all. And then later we improvise in the cathedral and the music clearly comes from the canyon."

"If you don't take risks improvising, you're left with nothing more than you had before," says Halley. "I think it's arrogant to try to write anything in this environment. The canyon intimidates me, and I want that to continue. I'm trying to take in as much as possible. When I return to New York City, the polar opposite of the Grand Canyon, I'll let the music out. The challenge is to accept something of this environment, and when I return home, write from what I absorbed."

Who can say what music suits the Grand Canyon? Not many contemporary composers concern themselves with such questions. We have the clip-clop of mule hooves in Ferde Grofe's *Grand Canyon Suite*, and Oliver Messiaen's challenging *Des canyons aux étoiles* —"from the canyons to the stars"—inspired by a trip to nearby Zion and Bryce canyons in Utah. In this work, French horns flutter like canyon wrens in what Messiaen calls "a religious work, a work of praise and contemplation . . . a geological and astronomical work, a work of color-sound. . . ."

Toward the end of *Desert Solitaire*, Edward Abbey muses about what music suits the rocky deserts of the canyon country: "We can find a certain resemblance between the music of Bach and the sea; the music of Debussy and a forest glade; the music of Beethoven and (of course) great mountains. . . . In the desert I am reminded of something quite different—the bleak, thin-textured work of men like Berg, Schoenberg, Ernst Krenek, Webern and the American, Elliott Carter. . . . their music comes closer than any other I know to representing the apartness, the otherness, the strangeness of the desert."

That is Abbey's desert, but lying back in side canyons listening to the noisy and joyous courting of frogs and toads, the clear deliberate glissando of the canyon wrens, and the punctuating calls of ravens, I have imagined other sounds that suit the still, warm air of these spaces.

I HAVE ALWAYS WANTED to hear a pipe organ here. For side canyons are church naves; any map proves that. Cathedral in the Desert, Music Temple, The Transept—and above these the ramparts rise as mesas and buttes: Vishnu Temple, Church Rock, Krishna Shrine, and the Great White Throne of God in Zion Canyon.

When I hear Halley play the harmonium here, it seems to fit. He is a church organist, and his improvisations reflect this. The organ I hear is not the Grand Canyon singing, but Halley's distillation

Musicians Eugene Friesen on bass (top), Glen Velez on frame drum (left), Paul Halley and Paul Winter with sax (right), and Steve Silverstein (bottom) during the making of their new album, Canyon.

of what he feels here. It is human music in a place that barely acknowledges humans, a place of rock, water, and time. We make music here as a form of worship, a prayer we offer to the canyon. And somehow, in making this offering, we make the Grand Canyon something other than terrifying.

Thoughts, sounds, and lives do not ever entirely disappear; even after they happen and we think they have ended, they hover out there somewhere. Music echoes in the canyon, then it is gone. Waterfalls come after rains, then trickle away to a few pools. But waterfalls and melodies leave the canyon invisibly different, a little transformed.

"As musicians in the canyon, each of us tries to embrace it in an inner way, to capture the more yielding, giving qualities," says Friesen. "The solos and duos come closest to the canyon for me; the bigger the ensemble, the more futile it seems our attempt to capture it. When I play the music in concerts, it isn't the memory of rapids that rekindles the experience; it is the call of the canyon wren."

ANOTHER SIDE CANYON, an amphitheater of Muav limestone that makes a fine recording studio. The musicians begin to settle in. Winter lies on his back on a ledge. Velez stoops over an eroded boulder, his head bowed. He rests his fingertips on the sharp projections of the rock, stays motionless for several minutes, then begins to pull and knead the air just above the stone. Lime-green redbud leaves flutter over him.

Velez talks less than the other musicians. He goes off alone to sit on a hill, then comes back with new musical ideas. He doesn't talk about them, he plays them. "I know I have done best when I feel like I'm not doing much, but then realize when I quit that I've been in a different state. I feel most pleased with my music when I've been 'gone,'" he says. "Sometimes I don't hear how soft some of the drum sounds are. I'll say to a listener, 'Wasn't that a nice sound?' and they haven't heard it."

I wander off and bathe in a pool, then climb out and lean back on a rock. Smooth, gray limestone curves cradle me in 400-million-year-old stone. The creek burbles. I close my eyes in the sun. I can sense the undulant rocking of the raft under me—the feeling of many days on the river. And on the wind a hint of music—the deep beat of Velez's drum, soaring sax notes.

I return downcanyon toward the musicians. From a Muav boulder I listen to Velez and Winter—more echo than pure tone. I can see them, tiny figures, but the music expands their presence as it drifts up 2,500 feet to fill the inner gorge. I see kestrel worrying red-tailed hawk, monkeyflower dropping scarlet blossoms into the creek. Red cliffs soar back and up and up.

Friesen says that, tired as he is at the end of each day, by night he wants to stay up and write music for the canyon.

Canyon time. The present seems eternal, yet surrounded by the past made starkly visible. The future is just more miles on the river.

In few other wild places do I feel so cut off from human existence. The rim represents the outer world, the walk down through the cliffs and ledges purgatory, the inner canyon a true underworld. Each image and event becomes vivid and charged with meaning.

The inscrutable canyon sends out messengers: The sun breaks through a storm and blazes on yellow-blossoming brittlebush at Dubendorff Rapid and a waterfall in Stone Canyon; ravens clown; a desert spiny lizard does push-ups on a boulder rounded by the river; a pink rattlesnake coils under a prickly-pear cactus; bats hunt at 11 a.m.

Just as all that pass through change the canyon, the canyon changes all that pass through: the river, the people who float by on their rafts with their gear and their musical instruments lashed on and wrapped in many layers of plastic.

The Grand Canyon is like a journey through time, life, Earth, underworld: It is any reality we care to invent. Paul Winter tries to capture this in his music.

It's a hard place to understand. But somewhere in the mixture of music and color and eternity that we see and hear, there are hints.

When you go to the canyon, listen for them. ■

Stephen Trimble *is a writer and photographer living near Santa Fe, N.M. He co-wrote the liner notes and edited the booklet for* Canyon *(Living Music Records, 1985).*

WHICH DO YOU THINK SHE NEEDS MORE, YOUR LETTER OR CLEAN DRINKING WATER?

Save the Children believes essentials like clean water and adequate food are more important than letter writing between sponsors and children. That's why we developed LIFELINE.

LIFELINE is different from most sponsorship plans. Because we've cut administrative costs, more money can be devoted to making a permanent, meaningful change in the children's lives.

As a LIFELINE sponsor, you contribute just 46¢ a day to help all the children in a needy area you select. Your contribution, combined with other sponsors', provides self-help programs that benefit the children and the entire community.

To make your money go further, we select one child to speak for all the children there. Through this child's photo, personal history and letters, you and other sponsors will share a part of all the children's lives. You'll also receive progress reports showing the difference your generosity has made. But above all, you'll get the satisfaction of knowing you're helping as many children as you possibly can.

So many children are depending on you... for clean water, food, medical care, and essentials they really need. Don't disappoint them. Become a Save the Children sponsor now.

HERE'S HOW YOU CAN HELP SAVE THE CHILDREN

Save the Children, 50 Wilton Road, Westport, Connecticut 06880
Attn: David L. Guyer, President

☐ I want to become a LIFELINE sponsor. Enclosed is my first monthly payment of $14. I prefer a ☐ boy ☐ girl ☐ either

☐ **Where the need is greatest.**

☐ Africa	☐ Mediterranean
☐ Asia	☐ Middle East
☐ Caribbean	☐ Pacific Islands
☐ Central America	☐ South America
☐ Himalayas	☐ United States

Name _____

Address _____

City _____ State _____ Zip _____

☐ Instead of sponsoring at this time, I am enclosing a contribution of $ _____ .

☐ Please send me more information.

Because 53 years of experience has taught us that direct handouts are the least effective way of helping children, your sponsorship contributions are not distributed in this way. Instead, they are used to help children in the most effective way possible—by helping the entire community with projects and services such as health care, education, food production and nutrition. Our annual summary with financial statement is available upon request.

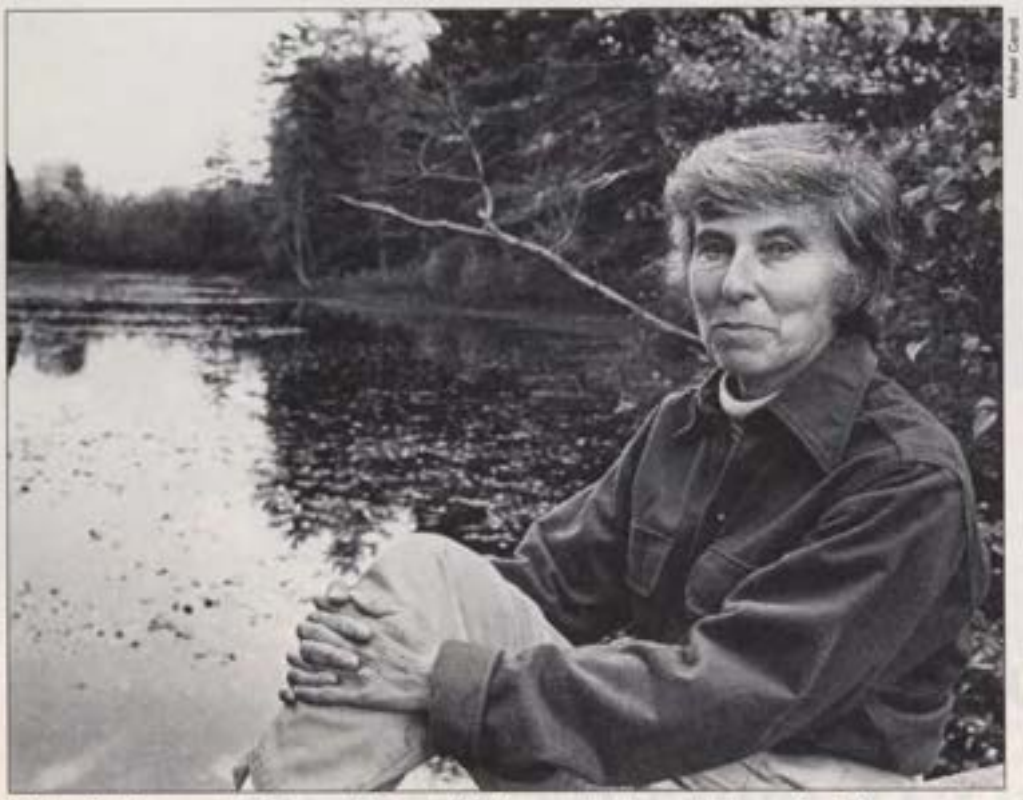
Your sponsorship contributions are U.S. income tax deductible.

Save the Children®

saving one child is not enough

SCB 3/6

The Audacious Vision of Marion Stoddart



Michael Carroll

Marion Stoddart moved to Groton, Mass., in 1962 to meet the biggest challenge of her life.

John J. Berger

A FEW MILES WEST of Fitchburg in north-central Massachusetts, a web of shimmering brooks and lively springs merges to form the Nashua River, which then flows north toward New Hampshire, through 56 miles of venerable small towns—some of them virtual colonial museums—past fields, wetlands, and forests.

Before Europeans first settled here, the Nashaway Indians inhabited the river valley, hunting game in the virgin forests and fishing in the crystal water. They called it Nashua, "river with the beautiful pebbled bottom."

But neither pebbles nor bottom were visible by the late 1960s, and all the fish were gone. Drawn by free hydro power for saw and cotton mills and clean water for manufacturing, local industry had used the river for more than 250 years as a 50-mile-long sewer.

East and north of Fitchburg, the Nashua was thick with decaying organic matter and industrial chemicals. Its color ranged from reddish-brown to red, white, blue, or green, depending on the color of paper being made by the manufacturers who poured their pigments into the river. Without this artificial coloring, the Nashua was a sinister greenish-black.

Raw sewage in the river carried typhoid and other diseases. Decaying organic material consumed so much oxygen that little or none was left for aquatic life. And the river gave off an odor so strong that people living nearby claimed it kept them awake at night.

When the high waters of spring receded, the Nashua's banks and even trees along the river were coated with paper sludge the consistency of wet egg cartons. Pulp and other sludge rose to the river's surface, buoyed on stinking bubbles of hydrogen-sulfide gas.

Local citizens had discussed the river's problems for years, but the talk never seemed to lead to effective action. Only a few people like Marion Stoddart had the audacity to think they could change the situation.

When Stoddart moved to Groton, Mass., on the banks of the Nashua in 1962, the river was considered one of the most polluted in the country, and getting worse. The U.S. Army Corps of Engineers looked at the river and pronounced it dead. Wildlife and fish could not be restored, they said.

Even so, Stoddart gazed at the filthy river and saw it transformed. Along the riverbank, where others could see only decaying paper pulp, she imagined greenways where families could stroll, cycle, or launch a canoe; where wildlife could be studied; where folks could enjoy a picnic or cast for bass and pickerel.

BEFORE BECOMING involved in restoring the Nashua, Stoddart was busy trying to be a good mother, wife, and citizen. Yet she felt a strong need for a more challenging vocation. "I was looking for a project," she says, "and I wanted it to be the greatest challenge that I could take on and feel that I could achieve during my lifetime."

"Coming from Nevada, where there's so little precipitation, and living on a farm where we irrigated made me more sensitive to water resources and their value."

Stoddart was no stranger to community work. In her youth she was a teacher at a nature school, a camp counselor, and a Girl Scout leader. Much later, as president of the League of Women Voters in Sudbury, Mass., she successfully worked to protect wetlands between the Sudbury and Concord rivers. This effort culminated in a successful citizen campaign for passage of the 1966 Massachusetts Wetland Act.

For months she vacillated between doing social work and further environmental work. Finally, drawn by her vision of a cooperative venture by industrialists, businesspeople, and homemakers, Stoddart set to work on her dream for the Nashua River.

She knew that her task was formidable: At best the project would take years to complete. When she met with community leaders to find out what plans they had for acquiring land along the river, "they laughed at me. I was told the state had no money to purchase land along polluted rivers." It was clear that before any move could be made to acquire land for a greenway, the river itself would have to be cleaned up.

Stoddart contacted the New England Interstate Water Pollution Control Commission, which had developed a water-quality agenda for New England. But she was disappointed to find that its goals for the Nashua were low indeed. Much of the river—its north branch and part of the main stem—was to be given a "D" classification, which would have precluded using it for anything but power, navigation, and moving sewage and industrial wastes.

So Stoddart organized the Nashua River Cleanup Committee to help change the laws and begin a river cleanup. The group worked to gather support for a bill known as the Massachusetts Clean Water Act, which would set up a water-pollution control agency, make state funds available to build wastewater treatment plants, and classify the state's rivers and assign them water-quality goals.

The committee gathered more than 6,000 signatures on petitions calling on Gov. John A. Volpe to do everything in his power to clean up the river. Then it mobilized key government officials of towns along the river to attend a meet-

ing with the governor asking him to help pass the bill.

This large response impressed Volpe. When the committee presented him with a bottle of revoltingly dirty river water, he was shocked, and promised to keep it on his desk as a constant reminder until the river was cleaned up. He eventually signed the Clean Water Act of 1966, and the Nashua cleanup campaign was suddenly in high gear.

By this time Stoddart was spending much of her time away from home, in meetings. Dedicated to both her career and her family, she faced some difficult decisions.

"It was really hardest for Tom [her youngest child]," she recalls, "because he was in kindergarten then, and needed more time than the other children; I still feel a lot of guilt associated with this. Our children are all grown now and leading very good lives, but with Tom it meant I was out a lot at night, and when our other children were his age I would spend more time reading to them.

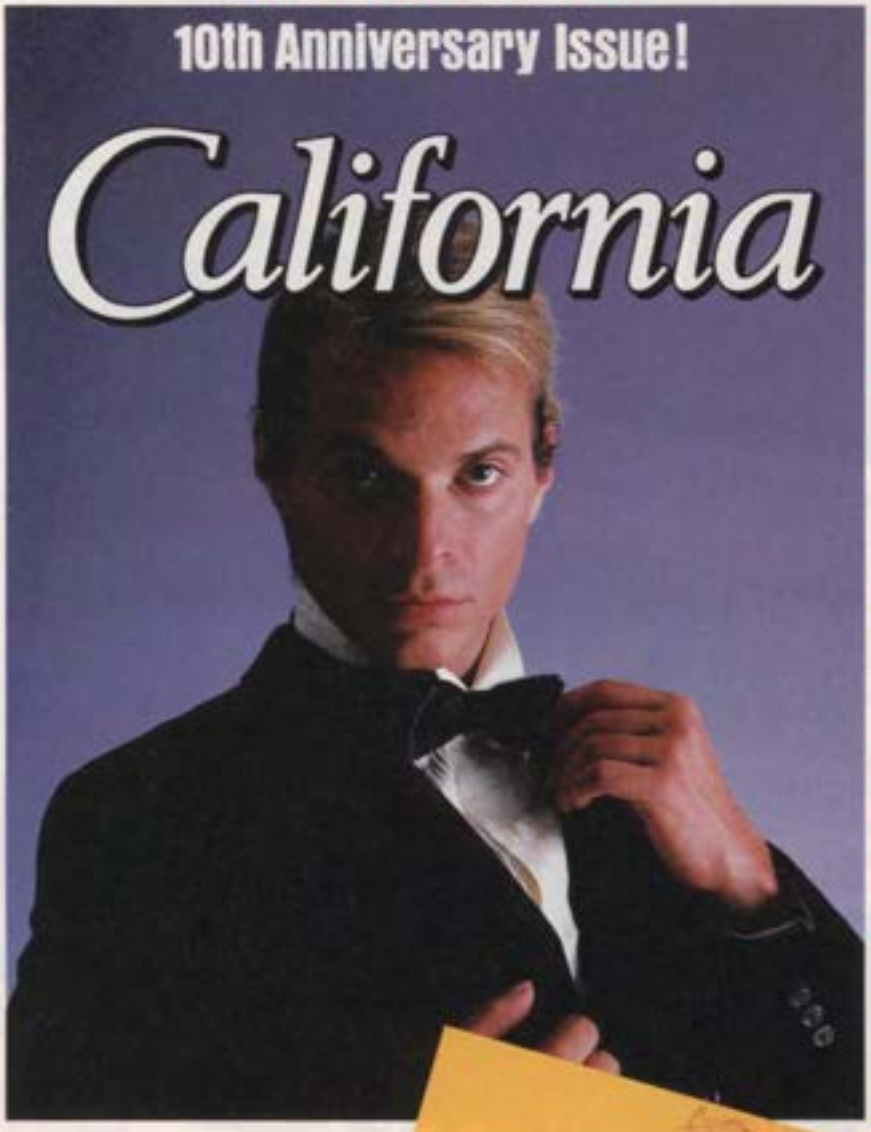
"But I made a conscious choice about how I was going to spend my time," she adds. "I felt there was a very brief period of time to save the river, and that certain things had to be done at certain times; that if the river were restored—this is my rationalization—then hundreds of thousands of people would be able to enjoy it. And that was a sacrifice that I was having to make."

Fortunately, Stoddart was not alone in her fight. There was Wayne Kimmerlin, chair of the Hollis Conservation Committee across the border in New Hampshire. Kimmerlin had initiated the petitions calling for a Nashua River cleanup. Lee P. Farnsworth of Lancaster, Mass., was also a pivotal figure. In 1962 he set up the Nashua River Study Committee when the nearby city of Leominster was given permission to dump millions of gallons of raw sewage per day into the river. Both Kimmerlin and Farnsworth had laid the groundwork for the cleanup committee's rapid success in environmental politics.

As the 1960s drew to a close, the patient efforts of Farnsworth, Stoddart, Kimmerlin, and many others began to reinforce each other. Under the terms of the federal Clean Water Act of 1965, the cleanup committee got the state to hold a hearing on the Nashua in Fitchburg; then it doggedly spent a year preparing for the confrontation. "We identified every organization in every community in the watershed and asked them to prepare a statement," says Stoddart. "The message I was trying to get to the people—and those that were there got the message, and believed it—is that people make a difference. If you join together and you're persistent, you can bring about a change."

State officials were surprised to see hundreds of people come to what they presumed would be a routine hearing. The meeting lasted well into the night. Citizens asked for a "B" classification—suitable for bathing, fishing, and public water supply—almost without exception; industry, joined by the state public health department and the city of Fitchburg, asked for a "D." State and federal officials eventually compromised by giving the river a "C" rating amended

50% OFF



Save 50% on:

- Unequalled coverage of the arts and music
- The finest reporting in the state
- Insightful political analysis

and more. . . .

- Kicky fashions just right for California
- Mouth-watering flavors from California's cuisine
- Visits to undiscovered spots in California

Yes, just $12.00—half the newsstand price—gives you the best of California—every month.

In California call 1-800-543-2400 for this special price and save 50%.

PLUS all the color diversity, art, politics, trends and personalities that put California on the leading edge of this nation.

Call now to order at 50% savings. In California call 1-800-543-2400

By the early 1960s, Fitchburg's paper industries had turned Massachusetts' Nashua River into a thick, foamy sewer (right). Today, 20 years later, activist Marion Stoddart is able to enjoy the fulfillment of her dream: a canoe ride on the clean, protected, swimmable river.

by the requirement that the water meet "B" level bacterial standards. Encouraged by these gains, the cleanup committee set out to ensure that public funds would be available for cleanup work.

They first had to persuade Fitchburg's polluting paper companies to join with the city in working to meet the new water-quality standards. Stoddart convinced the giant Weyerhaeuser Corp., which had halted work on its own pollution-abatement system, to cooperate; the smaller paper companies then followed suit, and agreed to 20-year contracts with the city. Two large treatment plants were designed and approved, and construction was slated for 1973.

To expedite fundraising and become eligible for federal model-river demonstration funds, the cleanup committee reorganized in 1969 as the Nashua River Watershed Association, Inc. This led to the acquisition of funds from the New England Regional Commission for a five-year model-river demonstration program, and eventually brought in an additional $5 million in Department

We Never Said Important Work Couldn't Be Fun!

The first sentence of the Sierra Club's motto states it clearly: "to explore, enjoy, and protect the wild places of this earth." Our programs promote a unique and unbeatable blend of work and fun.

Since the earliest days, Sierra Club members have hiked, climbed and rafted in our country's most spectacular settings. Today, our trips range from local day hikes to worldwide trips.

So join the organization that believes important work should be fun. For your convenience, a membership form appears on the reverse side.

SIERRA CLUB

MEMBERSHIP FORM

☐ Yes. I want to join! Please enter a membership in the category checked below.

New Member Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS: If you are giving this membership as a gift, please enter your name and address below:

Donor Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS will be announced by a special gift card in your name.

MEMBERSHIP CATEGORIES

	Individual	Joint
Regular	☐ $ 29	☐ $ 33
Supporting	☐ $ 50	☐ $ 54
Contributing	☐ $100	☐ $104
Life	☐ $750	per person

SPECIAL CATEGORIES

	Individual	Joint
Senior	☐ $15	☐ $19
Student	☐ $15	☐ $19
Spouse of Life Member (Annual Dues)	☐ $15	

All dues include subscription to *Sierra* ($6) and chapter publications ($1).

Sierra Club Dept. J-155, P.O. Box 7959, San Francisco, CA 94120

Residents of Canada, please remit in Canadian funds to:
*508 47 Colbourne Street, Toronto, Ontario, M5E 1E3 (Eastern Canada)
P.O. Box 202, Victoria, British Columbia, V8W 1R8 (Western Canada)

MEMBERSHIP FORM

☐ Yes. I want to join! Please enter a membership in the category checked below.

New Member Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS: If you are giving this membership as a gift, please enter your name and address below:

Donor Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS will be announced by a special gift card in your name.

MEMBERSHIP CATEGORIES

	Individual	Joint
Regular	☐ $ 29	☐ $ 33
Supporting	☐ $ 50	☐ $ 54
Contributing	☐ $100	☐ $104
Life	☐ $750	per person

SPECIAL CATEGORIES

	Individual	Joint
Senior	☐ $15	☐ $19
Student	☐ $15	☐ $19
Spouse of Life Member (Annual Dues)	☐ $15	

All dues include subscription to *Sierra* ($6) and chapter publications ($1).

Sierra Club Dept. J-155, P.O. Box 7959, San Francisco, CA 94120

Residents of Canada, please remit in Canadian funds to:
*508 47 Colbourne Street, Toronto, Ontario, M5E 1E3 (Eastern Canada)
P.O. Box 202, Victoria, British Columbia, V8W 1R8 (Western Canada)

of Commerce funds for cleanup work.

Mayor William Flynn of Fitchburg contends that the river cleanup saved jobs in the town's paper industry. Without the cleanup committee's fundraising efforts, he says, the paper companies wouldn't have been able to afford to build their own pollution-control facilities and would have had to close. Fifteen hundred jobs were thus protected, and paper mills worth $60 million to $100 million kept in production.

In 1969 Stoddart received an unexpected boost from the U.S. military. The base commander of Fort Devens, on the banks of the Nashua, offered her the use of a two-story barracks as an office, plus the full-time services of professional military officers and others.

When the comprehensive water plan had been written, Stoddart convinced one of the polluting paper companies to donate paper to publish it; then she found a local school to print the plan, gratis, and a local banker loaned his employees to collate. By now Stoddart had become a prominent figure in the watershed. Some people half seriously referred to her as Mother Nashua.

The association worked on getting everyone concerned to help implement the plan and work on acquiring land for the greenway. Lois Murray, who directed the watershed association for five years, was a major force for acquisition of the greenway lands. Murray helped the association add nearly 70 miles of shoreline containing 6,000 acres of land.

MAJOR ADDITIONS to the Nashua River greenway now include the Squannacook Wildlife Management Area, which protects one of the state's best trout streams; the Oxbow National Wildlife Refuge, which provides a wetland sanctuary for migratory wildfowl; and the pine-covered hills of the Bolton Flats Wildlife Management Area, with 300 different wildlife species. Nashua greenway lands are now used by cross-country skiers, hikers, cyclists, hunters, birders, and strollers.

But while the sewage-treatment plants have eliminated sludge, foam, and solids from the Nashua River, some problems remain. Excess coliform bacteria and high nutrient levels persist in much of the river, and large quantities of old polluted sediments in the river bottom may be indirectly responsible for the fact that lead and chromium are found in Nashua fish.

Nonetheless, today the river has bass, perch, pickerel, and German brown trout, and is fished by mergansers, bald eagles, osprey, and great blue herons, not to mention humans. Bass fishermen are coming from as far away as South Carolina. The Nashua has once again become an economic and aesthetic asset to the region. Declared a Local Scenic River by the state in 1984, it now has (except for one three-mile stretch) a "B" classification.

Marion Stoddart has many causes for satisfaction when she thinks about the improvements that have been made and the long-awaited creation of the greenway. "I've seen my vision for the river unfold," she says. "My major goals have been accomplished." ■

***John J. Berger** lives in Albany, Calif. This article was adapted from his book* Restoring the Earth. *Copyright © 1979, 1984, 1985 by John J. Berger. Adapted with the permission of Alfred A. Knopf, Inc.*

© Don Crawford

A hiker looks down at Headquarters Creek in the Bob Marshall Wilderness.

A New Way to Keep It Wild

THE BOB MARSHALL, MONTANA

IT MAY DO for wilderness management what polypropylene did for long underwear. It's a state-of-the-art plan for managing the Bob Marshall wilderness complex in northern Montana. "Nothing like it exists anywhere yet," says long-time wilderness advocate Arnold Bolle, dean emeritus of the University of Montana's school of forestry. "It sets the pattern for similar accomplishments throughout the country."

The Bob Marshall wilderness complex is a 1.5-million-acre tract made up of three contiguous wilderness areas (the Bob Marshall, Great Bear, and Scapegoat) in four different national forests (Flathead, Lewis and Clark, Lolo, and Helena). It's a charmed land of grizzly bears, golden eagles, mountain goats, glacier lakes, and a long, steep ridge called the Chinese Wall.

But for several years now, there have been problems in the Bob. Use of the wilderness increased 60 percent from 1970 to 1982. Campgrounds deteriorated. Certain horse trails began to look more like World War I trenches than wilderness pathways. Questionnaires completed by visitors to the complex showed that many were increasingly disappointed by a lack of solitude and by conflicts with other users.

In response, the Forest Service organized a citizen task force in February 1982 that initiated a process called Limits of Acceptable Change (inevitably known as LAC). An alternative to the "carrying capacity" approach, LAC focuses on impact instead of numbers of users.

"Carrying capacity is an overall figure, and it suggests that the first solution to a management problem is to limit numbers," Bolle says. "LAC gets at specific problems and considers various ways to solve them. For example, we have a trail in a boggy area. The alternative is probably not to limit numbers but to relocate the trail.

"In the Bob Marshall wilderness complex, we think we can solve many problems without limiting numbers," Bolle continues, "though limits may sometimes be necessary."

The Bob's management plan allows no change in the pristine condition of certain areas—not even trails would be allowed in these. Along heavily used trails, some development would be permitted, including outfitter camps and simple facilities to protect the resources. Areas where deterioration has already gone beyond acceptable levels would be rehabilitated.

Most impressive is the way the plan was developed. It was written not by Forest Service paper pushers but by users of the Bob. Environmentalists, outfitters, hikers, elk hunters, and others have worked hard on the plan right from the start.

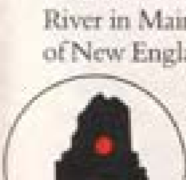
"It's had more public input than other plans I'm aware of," says Jack Johns, a Sierra Club member from the Flathead Chapter of the Montana Wilderness Association who worked on the task force. "Environmental interests were quite well represented."

The plan is now in its final stages of development, and should become official soon. But the task force's job is not over. The group will monitor LAC's effectiveness and recommend changes where necessary. Nobody claims the plan is perfect, but backers hope it will serve as a model for public involvement in wilderness resource management.

Energy Experts Rescue a River

BIG A FALLS, MAINE

Big Ambejackmockamus Falls on the West Branch of the Penobscot River in Maine lies in the middle of half of New England's remaining wildwater.



It is just downstream from the nesting grounds of osprey and bald eagles. In the swift current above the falls, landlocked salmon feed and spawn.

But Big Ambejackmockamus Falls, or the Big A, is also the proposed site of a 40-megawatt hydroelectric plant. The

Great Northern Paper Company, Maine's second-largest employer, wants to build its 20th dam on the Penobscot. The company believes the dam will reduce its dependence on foreign oil, cut its production costs, help maintain production in low water years, and reduce air pollution in the state.

New England conservationists believe Great Northern's goals can be accomplished without constructing the dam. During testimony before the state's Land Use Regulation Commission (LURC), the Conservation Law Foundation of New England (CLF) asked Great Northern to consider other options.

The foundation argued that Great Northern could accomplish its goals by


Chris Ayres

Troublemaker Rapids: The Big A Dam would put them under 40 feet of water.

increased use of cogeneration and conservation techniques. The foundation called in Amory Lovins, an internationally known energy expert, who suggested 14 proven energy-saving techniques that could conserve nearly twice the delivered output of the Big A at one sixth the dam's cost.

During cross-examination, company officials disclosed that Great Northern's last analysis of its conservation potential was done eight years ago, before many of today's technologies had emerged; that it had no specific budget for conservation; and that it had spent less on conservation in recent years than in the past. Great Northern has never measured the electrical efficiency of its motors, even though they account for 98 percent of the company's energy use.

CLF's next witness, Gordon Thompson of the Institute for Resource and Security Studies, presented some co-

Minnesota Vacation News So Exciting It Leaps Off The Page.

The New Summer Minnesota Explorer Is Free.

It's News You Can Use To Plan A Great Trip.

There's so much happening in Minnesota this summer, we can hardly contain it all in our new 24-page Minnesota Explorer newspaper. It's full-color, full-size and simply bursting with summer vacation news — and you can have it. *FREE.*

Between our pages is everything from Indian Pow Wows to a premiere Japanese art exhibit. You'll read about white-water rafting and downrigging for walleyes. Plus our big summer calendar has 560 events to guarantee fun for everyone.

So hurry. Have Minnesota delivered to your door. And make it come to life for you. Just call *toll-free* **1-800-328-1461** (National) **1-800-652-9747** (In MN) **296-5029** (Minneapolis/St. Paul)

04

Please send me the new Minnesota Explorer! FREE! Call toll-free 1-800-328-1461 (National) 1-800-652-9747 (In MN) 296-5029 (Minneapolis/St. Paul)

Name_____

Address_____

City_____ State_____

Zip_____

Send to:
Minnesota Travel Information
240 Bremer Bldg.
419 N. Robert St.
St. Paul, MN 55101

205

EXPLORE MINNESOTA

generation alternatives. Cogeneration uses fuel to generate electricity from a gas turbine, then uses the excess heat produced to fire a steam generator. Great Northern officials admitted that a combination of conservation and cogeneration could replace the power output of the Big A dam at comparable cost.

The experts even presented one option that would produce enough energy to allow Great Northern to sell excess electricity to Maine's utilities—without constructing the dam.

The company originally claimed that it would consider any alternative that matched the Big A in output and cost. As more and more experts testified that construction of the dam was financially unwise, however, it became obvious that Great Northern's image was at stake. Reversing its earlier position, the company declared that it would accept no alternative to the Big A.

When Maine's LURC granted the permit, subject to a jobs guarantee and a companywide independent energy survey, it appeared that Great Northern had won. But the company suddenly decided it could not live with the conditions and sought to reopen the hearings. In December that petition was denied. In January parallel water-quality hearings also went against the company. It now appears the Big A will never be built.

The South Texas Wilderness Nexus

LOWER RIO GRANDE VALLEY, TEXAS

FOR THOSE who know them well, the floodplain forest, brush, and wetlands of South Texas provide a connection with the primeval world.

Bordered by the lower stretches of the Rio Grande, the region extends 190 miles from Falcon Lake to the Gulf of Mexico. Several ecosystems converge here: Life forms from Mexico cross over into the United States, making the area home to many rare species. It is also where the migratory paths of millions of birds intersect.

An ocelot—one of the Lower Rio Grande Valley's more unusual wildlife treasures.

In 1985 the governments of the United States and Mexico agreed that the region should be considered for the United Nations' "biosphere reserve" designation, which identifies and protects areas of international environmental significance.

But commercial and agricultural development, which has already claimed more than 90 percent of the valley's original habitat, is expected to claim the remaining unprotected wilderness in less than five years. Wildlife is being relegated to shrinking wilderness islands lost in a sea of development, leaving species vulnerable to disease, weakened gene pools, and extinction. If much more wilderness disappears, so will much of the resident wildlife, including the bald eagle, the jaguarundi, and the ocelot.

To avoid this ecological disaster, the U.S. Fish and Wildlife Service (FWS) has chosen ten distinct wildlife communities totaling 107,500 acres of unprotected wilderness for acquisition and protection. The agency would use corridors of brush land to link important wilderness communities, such as the 24,000-acre Falcon Woodlands, with its Mexican ash, Texas sugarberry, mesquite, and snake-eye trees. The result would be a valley where wildlife has room to roam.

"In the last 20 to 30 years, we began losing valley wilderness at such a tremendous rate that we're really lucky to

have anything left," says Brandt Mannchen, wildlife chair for the Sierra Club's Lone Star Chapter. "The Sierra Club, the Audubon Society, and a few other voices crying in the wilderness helped alert the Fish and Wildlife Service to what was happening."

But lack of funding for FWS acquisitions is a major obstacle to the survival of the Lower Rio Grande Valley. Although Congress authorized protection for the valley in 1980, it has so far appropriated money for only 13 percent of the necessary lands.

Time is running out, says Cyndy Chapman, conservation chair of the Audubon Society's Frontera Chapter: "If we don't get an appropriations package big enough to protect the whole area within the next three years, the remaining wilderness will be lost."

Scenic Highway at a Crossroads

DEVIL'S SLIDE, CALIFORNIA

DEVIL'S SLIDE is an unsettled mass of earth that hangs above a stretch of one of America's most famous scenic roads, coastal Highway 1.

During the stormy winter of 1982, Devil's Slide closed a section of the highway just south of San Francisco where steep mountains meet the sea. When Congress responded with promises of up to

© Mark E. Gibson

Devil's Slide: a scenic but unsafe stretch of California's most famous highway.

REI:

(ār · ē · ī) n. **In 1938, Northwest climbers were the first to demand the quality gear only REI could supply.** Today, REI is the largest consumer cooperative nationwide, supplying the best outdoor gear and clothing available—from Gore-Tex® raingear to ultralight hiking boots, REI-designed packs to expedition-tested tents. At REI we strive to have your order on its way within 24 hours of receipt. And our money-back guarantee ensures your satisfaction.

REI®

Quality Outdoor Gear and Clothing Since 1938

Send for a free REI catalog!

Name _____

Address _____

City _____

State _____ ZIP _____

CODE 16

Please
Place
Stamp
Here

REI

CODE 16
P.O. Box C-88127
Seattle, WA 98188-0127

$50 million in emergency relief, the California Department of Transportation (Caltrans) pulled out plans for an inland bypass freeway that it has been promoting for 25 years.

The bypass proposal promoted by Caltrans last year was twice rejected by the California Coastal Commission on the grounds that it would cause excessive growth and threaten the rural character of lands along the coast. More recently the Commission approved a shorter bypass known as the Martini Creek Alternative. Environmentalists say this plan would cause many of the same problems as its longer cousin: It would bisect McNee Ranch State Park, cut chasms through coastal mountains, degrade historic Shamrock Ranch in Pacifica, and destroy agricultural lands. They also maintain that the Martini Creek proposal would violate provisions in the California Coastal Act that require that Highway 1 remain a scenic two-lane road in rural areas.

The Sierra Club's Loma Prieta Chapter and other organizations have been fighting the inland bypass idea for the past 15 years. They favor an option known as the Marine Disposal Alternative, which would release the sliding mass down the cliff and move the road 200 feet inland—a project that has been deemed feasible by Caltrans and several geologists.

"This option protects coastal resources while providing safe, stable, and permanent repair of the road," says Loma Prieta conservation coordinator Georgia Perkins.

In February the Coastal Commission endorsed the Martini Creek bypass in a 7-to-5 vote. Project opponents have vowed to appeal the decision. "It's a blatant violation of the Coastal Act," Perkins says. All parties to the dispute are working against a September deadline, after which federal funding for the project will be withdrawn.

"Even if the current pot of money is lost, something will have to be done to make the route safe," says Mark Delaplaine of the Coastal Commission staff. "Devil's Slide is moving at a rate of three feet per year. It will let go again." ■

Contributors: J. W. Edwards, James Glover, Jerry Perkins, Mark Vaz.

SIERRA NOTES

Sierra Club Books announces the March publication of *Earthly Delights* by Rosalind Creasy (new paper edition; $12.95, $11.65 for Sierra Club members). Books to be published in April include *Simple Foods for the Pack: The Sierra Club Guide to Delicious Natural Foods for the Trail* by Claudia Axcell, Diana Cooke, and Vikki Kinmont ($8.95, $8.05); *Energy Unbound: A Fable for America's Future* by L. Hunter Lovins, Amory B. Lovins, and Seth Zuckerman ($17.95, $16.15); *Walking Europe From Top to Bottom: The Sierra Club Travel Guide to the Grande Randonnée Cinq (GR-5)* by Susanna Margolis and Ginger Harmon ($10.95, $9.85); *Adventuring in the Alps* by William and Marylou Reifsnyder ($10.95, $9.85); *Adventuring Along the Gulf of Mexico: The Sierra Club Travel Guide to the Gulf Coast of the United States and Mexico* by Donald G. Schueler ($10.95, $9.85); and *Pacific Shift* by William Irwin Thompson ($15.95, $14.35).

These books may be ordered through the Sierra Club Catalog. Nonmembers may order *books only* from Sierra Club Store Orders, 730 Polk St., San Francisco, CA 94109; phone (415) 776-2211. Please include $2.50 postage and handling for orders up to $20, and $4.50 for orders over $20. Allow four weeks for delivery.

Sierra Club Election Update: By the middle of March, all eligible Sierra Club members should have received their ballots for the Board of Directors election. Ballots must be returned to the National Election Committee (P.O. Box 2178, Oakland, CA 94621) and must arrive no later than noon Saturday, April 12, 1986.

There are 13 candidates and one question on the ballot. The eight candidates who were selected by the Nominating Committee are: Shirley Taylor, Lawrence Downing, Jim Dodson, Jerry Akers, Vivien Li, Freeman Allen, Ruth Frear, and Hank Graddy. Five candidates qualified to run by submitting 184 or more signatures of Club members on petitions by the December 30, 1985, deadline. The petition candidates are: Dennis Willigan, Madge Strong, Sandy Tepfer, Jess Riley, and David R. Brower. Five of the 13 candidates will be elected to serve on the Board from 1986 to 1989.

The Board of Directors voted to place a question on the ballot regarding the dues rate for Regular Membership, as provided for in the Sierra Club Bylaws.

Election results will be announced in the next issue of *Sierra* and in earlier editions of some chapter newsletters.

The Sierra Club Annual Dinner will take place Saturday, May 3, at the Sheraton-Palace Hotel in San Francisco. The reception will begin at 5 p.m. and dinner ceremonies at 7. Honors and awards will be presented both before and after the dinner. For tickets and information call the Sierra Club's administrative office at (415) 776-2211.

The University of California–Berkeley will conduct a series of five weekly lecture programs this spring to commemorate the 20th anniversary of its Natural Reserve System, 26 areas managed for teaching, research, and public service. Speakers at "In Celebration of Nature" will include wildlife artist Robert Bateman and executive vice-president of the World Wildlife Fund, Thomas Lovejoy.

The lectures will take place at the U.C. Berkeley campus April 16 to May 14. Enrollment costs $40 for the series; single lecture tickets are $9. To register phone U.C. Berkeley Extension at (415) 642-4111.

Wilderness Survival Skills, a course taught by the Blue Ridge Group of the Virginia Chapter of the Sierra Club, will be offered for the fifth straight year May 2 to 4. Basic training will include medicine, shelter, edible plants, making fire, and finding water. The course will take place at the Wintergreen resort in the Blue Ridge Mountains near Charlottesville, Va. For more information write Bo or Jeanne Newell, Route 1, Box 304-B, Faber, VA 22938; phone (804) 361-1420. ■

SIERRA CLUB FINANCIAL REPORT

Fiscal year 1985

Pursuant to the provisions of sections 6321 and 6322 of the California Corporations Code, the following information is furnished as an annual report:

The Club's complete financial statements for the fiscal years ended September 30, 1985 and September 30, 1984, together with the report of Touche Ross & Co., independent accountants, are available on request from Sierra Club headquarters at 730 Polk Street, San Francisco, California 94109;

The membership list of the Sierra Club is on file at the Club's headquarters at 730 Polk Street, San Francisco, California 94109;

There are no transactions to disclose that constitute a conflict of interest involving directors or officers, no member has voting power of 10% or more;

The books of account and minutes of meetings of the Board of Directors are available for inspection by members on written request at the Club's headquarters at 730 Polk Street, San Francisco, California 94109.

December 11, 1985
Board of Directors
Sierra Club
San Francisco, California

We have examined the combined balance sheets of the Sierra Club and subsidiary as of September 30, 1985 and 1984, and the related combined statements of revenues, expenses and changes in fund balances and changes in financial position for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and other auditing procedures as we considered necessary in the circumstances.

In our opinion, the combined financial statements referred to above present fairly the financial position of the Sierra Club and subsidiary at September 30, 1985 and 1984, and the results of their operations and the changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Touche Ross & Co.

Certified Public Accountants

To the Members of the Sierra Club:

Prudent budgeting, strong staff work, and great public support for the goals of the Sierra Club combined to produce a very good Club financial year in the twelve months ending September 30, 1985.

While operating expense was about a half-million dollars over budget at $19.7 million, operating income was very strong at $21.1 million, over a million dollars ahead of projections (omitting Legal Defense Fund in both totals). Strong Development Department work on membership programs was an important part of this improvement: the Club ended its Fiscal Year at an all-time membership record, 362,564 strong! Gifts and donations to support Club programs were another major contributor to our health, totalling $6.9 million, more than 30% above the Fiscal 1984 level.

The management of the Conservation Department, which carried out an ambitious program while holding net outlays to 99.4% of budget, was a key asset, as was good work by Outings, Catalog, Books, and other areas.

Thanks to all these efforts, the Sierra Club showed a net surplus on operations of over $1.4 million, the best in our ninety-three year history.

These good results and our working capital preservation programs such as equipment leasing made it possible for the Club to come through the year with only minor short-term bank borrowing to cover our cash-flow needs. We ended the year with a much-needed net improvement in working capital of $1.5 million.

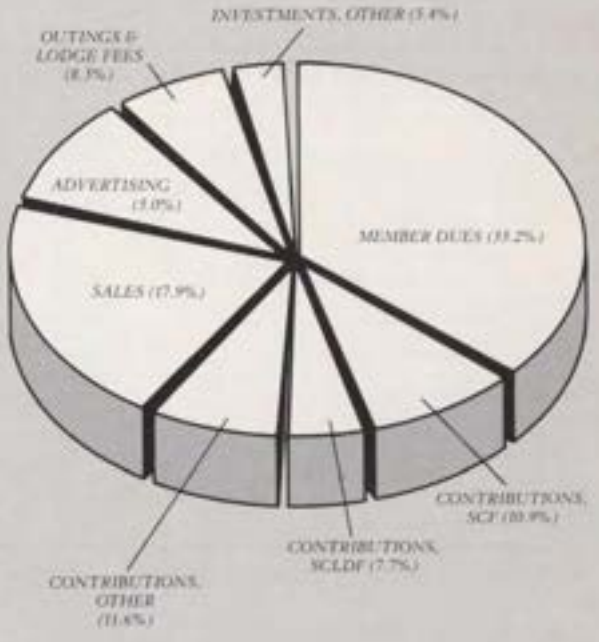
Despite this one good year, problems remain: The Sierra Club's liquid reserves are still small in proportion to the scale of our operations. We are still quite vulnerable to cash-flow problems if key income-producing programs are delayed or unsuccessful.

". . . In all great emergencies he commonly found that every one was more or less wrong," Henry Adams wrote. The duty of Sierra Club leaders is to apply our growing strength, the support of you, our members, so emergencies never arrive.

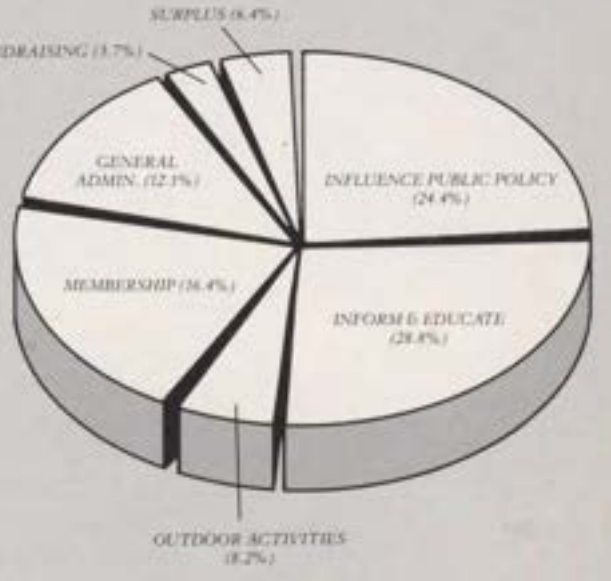
You're the best that money can't buy. Thank you for your continuing confidence and support.

Philip M. Hocker, Treasurer
Jackson Hole, Wyoming

Source of Funds



Use of Funds



Sierra Club & Subsidiary Combined Balance Sheets

Assets

	September 30 1985	1984
CURRENT ASSETS:		
Cash (primarily interest bearing accounts)	$1,166,100	$ 224,900
Trade accounts receivable, less allowances for returns of $75,000 and $120,000 (Note A)	913,400	447,500
Other receivables, less allowances for doubtful accounts of $36,000 and $30,000	496,300	375,500
Grants receivable	333,700	168,000
Inventories (Note A)	1,284,900	990,700
Advances, less allowances of $40,000 (Note A)	613,100	463,000
Prepaid expenses	996,800	455,900
TOTAL CURRENT ASSETS	5,804,300	3,125,400
INVESTMENTS (Note B)	2,330,200	1,982,200
PROPERTY AND EQUIPMENT (Notes A and C)	878,300	793,000
TOTAL ASSETS	$9,012,800	$5,900,600

Liabilities and Fund Balances

	September 30 1985	1984
CURRENT LIABILITIES:		
Bank overdraft	$ 274,400	$ 74,500
Accounts payable	2,782,900	1,990,400
Current portion of capital lease obligations (Note E)	83,800	49,900
Accrued expenses	556,300	481,500
Deferred revenue (Note A)	470,600	387,900
TOTAL CURRENT LIABILITIES	4,168,000	2,984,200
CAPITAL LEASE OBLIGATIONS (Note E)	148,900	13,500
FUND BALANCES (Note F):		
Unrestricted	2,308,200	859,800
Endowment	2,339,000	2,005,800
Restricted	48,700	37,300
	4,695,900	2,902,900
TOTAL LIABILITIES AND FUND BALANCES	$9,012,800	$5,900,600

See notes to combined financial statements.

Sierra Club & Subsidiary Combined Statements of Changes in Financial Position

	Year Ended September 30 1985	1984
FINANCIAL RESOURCES WERE PROVIDED BY:		
Excess of revenues over expenses	$1,459,800	$ 60,400
Add items not requiring working capital:		
Depreciation and amortization	322,500	262,000
Amortization of investments	(92,600)	(80,600)
Gain on sale of investments	—0—	(16,100)
TOTAL RESOURCES PROVIDED FROM OPERATIONS	1,689,700	225,700
New life memberships	333,200	297,900
Decrease in advances to affiliates	—0—	90,000
Proceeds from sale of investments	—0—	59,200
Increase in capital lease obligations	258,600	—0—
TOTAL RESOURCES PROVIDED	2,281,500	672,800
FINANCIAL RESOURCES WERE USED FOR:		
Purchase of noncurrent investments	255,400	408,300
Acquisition of property and equipment—net	407,800	149,000
Reduction of capital lease obligations	123,200	49,800
TOTAL RESOURCES USED	786,400	607,100
INCREASE IN WORKING CAPITAL	$1,495,100	$ 65,700
CHANGES IN COMPONENTS OF WORKING CAPITAL:		
Increase (decrease) in current assets:		
Cash	$ 941,300	$138,300
Trade accounts receivable	465,900	(315,100)
Other receivables	120,800	44,100
Grants receivable	165,700	(62,000)
Inventories	294,200	57,700
Advances	150,100	56,400
Prepaid expenses	540,900	10,900
	2,678,900	(261,700)
Decrease (increase) in current liabilities:		
Bank overdraft	(199,900)	88,200
Note payable to bank	—0—	400,000
Other note payable	—0—	100,000
Accounts payable	(792,500)	11,900
Current portion of capital lease obligations	(33,900)	(6,000)
Accrued expenses	(74,800)	(187,000)
Deferred revenue	(82,700)	(79,700)
	(1,183,800)	327,400
INCREASE IN WORKING CAPITAL	$1,495,100	$ 65,700

See notes to combined financial statements.

Sierra Club & Subsidiary Combined Statements of Revenues, Expenses & Changes In Fund Balances

Years ended September 30, 1985 and 1984

	1985 Unrestricted	Endowment	Restricted	Total	1984 Total
REVENUES:					
Member dues	$ 7,600,400			$ 7,600,400	$ 7,124,300
Contributions and grants	4,042,500		$2,870,700	6,913,200	5,253,300
Outings and lodge reservations and fees	1,902,500			1,902,500	1,928,100
Book and catalog sales	4,093,800			4,093,800	3,285,600
Royalties on publications	667,300			667,300	701,800
Advertising, investment and other income	1,715,200		1,500	1,716,700	1,364,700
	20,021,700		2,872,200	22,893,900	19,657,800
EXPENSES:					
Program services:					
Studying and influencing public policy	2,724,700		2,860,600	5,585,300	4,996,400
Information and education	6,379,900		12,100	6,392,000	6,267,400
Outdoor activities	1,821,400		52,300	1,873,700	1,913,200
Membership	3,750,000			3,750,000	3,613,300
	14,676,000		2,925,000	17,601,000	16,790,300
Support services:					
General and administrative	2,783,500			2,783,500	2,189,300
Fund raising	849,400		200	849,600	617,800
	3,632,900		200	3,633,100	2,807,130
	18,308,900		2,925,200	21,434,100	19,597,400
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENSES BEFORE ADDITIONS TO ENDOWMENT FUNDS	1,512,800		(53,000)	1,459,800	60,400
Addition to endowment fund—new life memberships		$ 333,200		333,200	297,900
EXCESS (DEFICIENCY) OF REVENUES AND ADDITIONS TO ENDOWMENT FUNDS OVER EXPENSES	1,512,800	333,200	(53,000)	1,793,000	358,300
Fund balances at beginning of year	859,800	2,005,800	37,300	2,902,900	2,544,600
Interfund transfers (Note G)	(64,400)		64,400		
Fund balances at end of year	$ 2,308,200	$2,339,000	$ 48,700	$ 4,695,900	$ 2,902,900

See notes to combined financial statements.

NOTE A—*Organization and Summary of Significant Accounting Policies*

Organization

The Sierra Club is a nonprofit voluntary membership organization established to explore, enjoy and protect the wild places of the earth. The Club operates many public interest programs covering a broad range of environmental issues. The studying and influencing public policy program consists of staff and volunteers engaged in legislative and nonlegislative activities including lobbying, research, legal and policy development. Information and education includes the literary programs of Sierra Club books, catalog operations and *Sierra*, the Club's magazine. Outdoor activities include national and international outing programs consisting of approximately 300 trips annually. The membership program serves approximately 363,000 members and includes support and funding of 57 volunteer chapters and over 330 groups, and the development of a broad-based volunteer membership.

Basis of Presentation

The combined financial statements include the accounts of the Club and its wholly-owned subsidiary, Sierra Club Property Management, Inc. The combined financial statements do not include the financial activities of the Club's various self-directed chapter and group organizations.

Some members of the Club have donated significant amounts of time to both the Club and its chapters, groups and committees in furthering the Club's programs and objectives. No amounts have been included in the financial statements for donated member or volunteer services inasmuch as no objective basis is available to measure the value of such services.

Summary of Significant Accounting Policies

Allowances for publication and catalog returns are determined using historical return rates.

Inventories consist of publications and catalog merchandise and are stated at the lower of cost or market. Unit costs for new books are based on paper, printing and binding charges only (manufacturing costs). Plant costs are amortized over unit sales for the first printing, but for no longer than the first twelve months of sales.

Sierra Club Property Management, Inc.'s investment in a limited partnership is accounted for by the equity method. Accordingly the investment represents SCPM, Inc.'s proportionate share of the loss of the partnership.

An allowance is provided against advances to authors for estimated losses resulting from unearned royalties.

Property and equipment are stated at cost at the date of acquisition or fair value at the date of gift or bequest. Depreciation expense is provided on a straight-line basis over the estimated useful lives (2 to 30 years) of the related assets.

All contributions are considered available for unrestricted use unless specifically restricted by the donor. Restricted contributions are recognized as revenue as the restrictions are met.

The Club defers revenue from outings and grants until the period the trip is completed or the grant requirement is met.

Legal services performed on behalf of the Club by the Sierra Club Legal Defense Fund are recorded as contributions with equivalent amounts charged to expense (Note J).

NOTE B—*Investments*

Investments of the Sierra Club Endowment Fund are stated at amortized cost. It is the Club's intention to hold investments to maturity. No allowance for the decline in market value below cost is established unless there is a permanent impairment of value. The composition of investments by fund group is as follows:

	September 30	
	1985	1984
Investments	$2,330,200	$1,982,200
Amounts due from unrestricted funds	8,800	23,600
Endowment Fund balance	$2,339,000	$2,005,800

Cost and market values at September 30, 1985 and 1984 were:

	1985	
	Amortized Cost	Market Value
U.S. government and federal agency bonds	$2,306,400	$2,387,300
Money market funds and savings account	23,800	23,800
	$2,330,200	$2,411,100

	1984	
	Amortized Cost	Market Value
U.S. government and federal agency bonds	$1,619,600	$1,562,600
Money market funds and savings account	362,600	362,600
	$1,982,200	$1,925,200

Investment income amounted to $256,600 in 1985 and $212,900 in 1984. The rate of return on endowment investments was 11% in 1985 and 13% in 1984.

NOTE C—*Property and Equipment*

	September 30	
	1985	1984
Land	$ 3,300	$ 3,300
Buildings and leasehold improvements	501,400	500,000
Furniture and equipment	1,331,400	1,200,000
Leased equipment	520,500	261,900
	2,356,600	1,965,200
Less accumulated depreciation and amortization	(1,478,300)	(1,172,200)
	$ 878,300	$ 793,000

NOTE D—*Line of Credit*

The Club has available to April 30, 1986 a revolving line of bank credit which permits borrowings of up to $1,750,000 at the bank's prime interest rate. No amounts were borrowed at September 30, 1985.

NOTE E—*Leases*

Substantially all leases are for office facilities, computer equipment, system software and other equipment. Certain leases provide for extensions and additional rental payments based on expenses. Future minimum payments under all noncancellable leases with terms greater than one year at September 30, 1985 are as follows:

Year Ended September 30	Capital Leases	Operating Leases
1986	$115,200	$1,194,400
1987	92,100	1,247,300
1988	77,100	1,241,800
1989	—0—	1,230,900
1990	—0—	1,226,800
Later years	—0—	4,923,100
Total lease payments	284,400	$11,064,300
Less amount representing interest	(51,700)	
Present value of lease payments	232,700	
Less current portion of capital lease obligations	(83,800)	
Capital lease obligations	$148,900	

Rent expense for operating leases was $480,100 in 1985 and $410,600 in 1984.

NOTE F—*Fund Balances*

The following is a summary of fund balances:

	September 30	
	1985	1984
Unrestricted Funds:		
Invested in property and equipment	$ 864,900	$ 729,600
Other unrestricted funds	1,443,300	130,200
	2,308,200	859,800
Sierra Club Endowment Funds:		
Life memberships	1,849,600	1,516,400
Designated by Board for permanent investment	489,400	489,400
	2,339,000	2,005,800
Restricted Funds:		
Expendable	26,300	15,800
Nonexpendable	22,400	21,500
	48,700	37,300
	$4,695,900	$2,902,900

NOTE G—*Interfund Transfers*

The transfer of $64,400 from unrestricted funds to restricted funds represents restricted expenses for nonregulated electoral activities incurred in excess of certain restricted fund balances.

NOTE H—*Income Tax Status*

The Club has received rulings from the Internal Revenue Service and State of California Franchise Tax Board granting exemption from income taxation. Contributions to the Club are not deductible for tax purposes by the donor.

NOTE I—*Pension Plan*

The Club has a defined benefit pension plan covering substantially all full-time employees who meet minimum age and service criteria. Voluntary employee contributions to the plan are permitted. Pension expense, which is funded currently, was $154,600 in 1985 and $185,300 in 1984.

A comparison of accumulated plan benefits and plan net assets as of the most recent valuation dates is presented below:

	October 1	
	1984	1983
Actuarial present value of accumulated plan benefits:		
Vested	$426,000	$300,900
Nonvested	69,000	86,900
	$495,000	$387,800
Net assets available for benefits	$956,700	$694,600

The weighted average assumed rate of return used in determining the actuarial present value of accumulated plan benefits was 7.5% for 1985 and 1984.

NOTE J—*Transactions with Affiliates*

The Sierra Club receives contributions from the Sierra Club Foundation and the Sierra Club Legal Defense Fund. Contributions from the Sierra Club Foundation represent direct grants to the Club in support of various programs and totalled $2,488,801 in 1985 and $1,808,641 in 1984. Contributions from the Sierra Club Legal Defense Fund for legal services performed on behalf of the Club totalled $1,760,700 in 1985, and $1,581,600 in 1984.

Sierra Club Property Management, Inc. (SCPM, Inc.) is the general partner of National Headquarters Associates (a limited partnership). The limited partnership was formed to raise capital for purposes of acquiring and rehabilitating an office building for lease by the Club. The building was completed and occupied by the Sierra Club in November 1985.

NOTE K—*Contingencies*

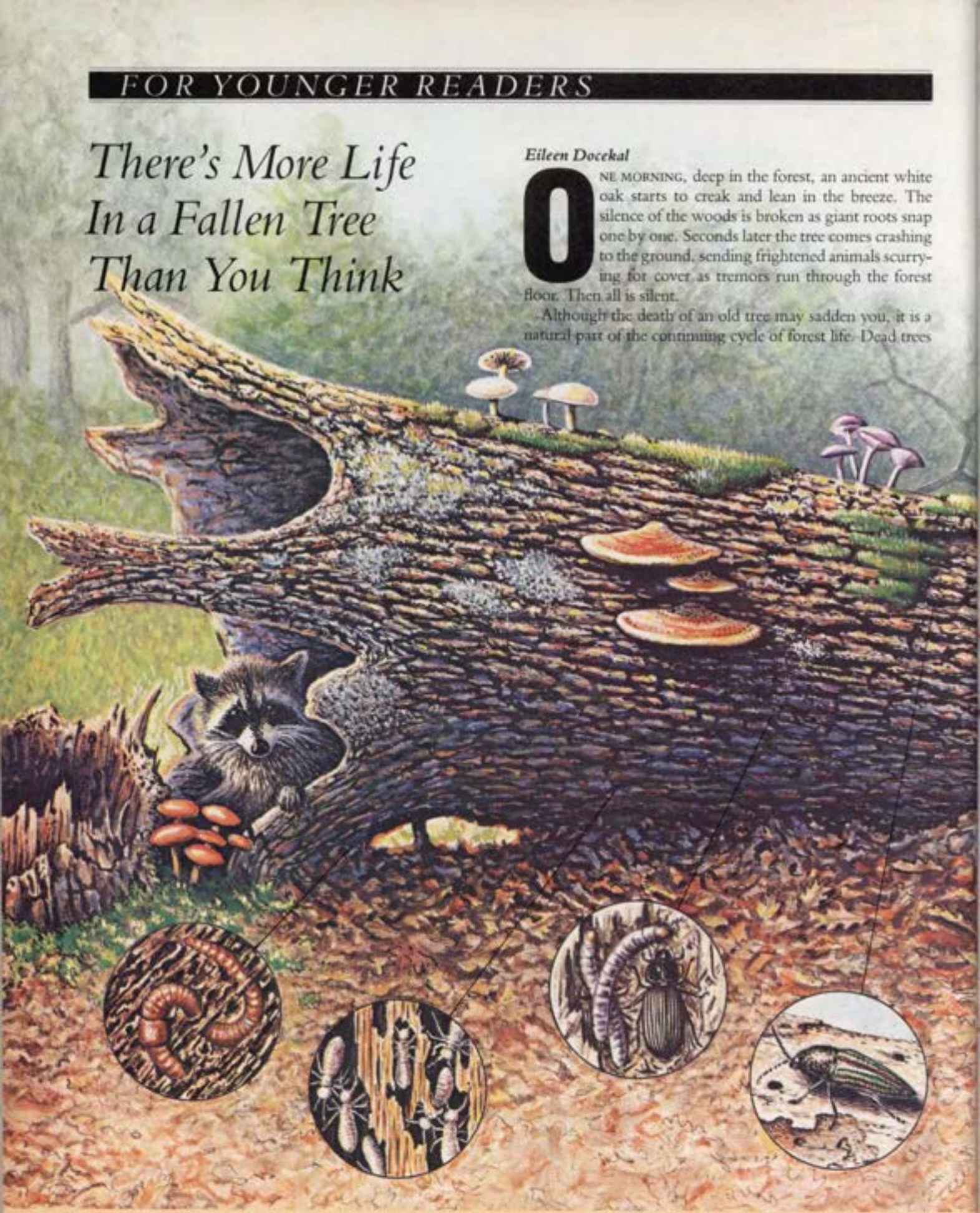
The Club has been named in various legal actions. In the opinion of management, the ultimate disposition of these actions will not have a material effect upon the financial statements.

There's More Life In a Fallen Tree Than You Think

Eileen Docekal

ONE MORNING, deep in the forest, an ancient white oak starts to creak and lean in the breeze. The silence of the woods is broken as giant roots snap one by one. Seconds later the tree comes crashing to the ground, sending frightened animals scurrying for cover as tremors run through the forest floor. Then all is silent.

Although the death of an old tree may sadden you, it is a natural part of the continuing cycle of forest life. Dead trees



provide food and shelter for many plants and animals. In turn, these plants and animals decompose (break down) the wood, returning it to the soil for new plants to use.

Termites, beetles, and other wood-boring insects are the first to attack the tree, because they can eat through the tough bark and digest wood. If you look at the bark of a dead tree, you can see tunnels where these insects lay their eggs.

Of course, some trees that are alive and standing already have insects and other decomposers living in them. This is a sign that the tree's bark has suffered a wound, allowing insects to invade. When insects eat out the inside of a tree from top to bottom—which can sometimes take more than ten years—the tree will die, and very likely topple over in a strong wind. This is probably what happened to the dead oak.

NOW THAT THE TREE has fallen, the wood-boring insects make the wood soft and mushy, and many more insects come to feed. Ants, gnats, mites, springtails, sowbugs, and flies can be seen living in colonies on a dead tree. As these insects break down the wood and multiply, they attract the many predators that feed on them, such as centipedes, spiders and scorpions, toads, moles, shrews, and woodpeckers. If the tree was hollow when it fell, it was probably used as a home by raccoons, chipmunks, or snakes. These animals will come back to use the tree after it has fallen.

But of all the creatures living on the tree, the most important decomposers are fungi and bacteria. Fungi are plants that don't have chlorophyll (*klor*-o-fill), the green pigment other

Bacteria (2,500×)

European earwig feeding on velvet mites (2×)

Red-bellied woodpecker

White-footed mouse

Toad

Centipede feeding on slug (life size)

Gray squirrel

Skunks

Bull snake

Elegant crab spider feeding on lined acrobatic ant (1½×)

plants use to make food from sunlight. Fungi get their nutrients from other plants instead. When a spore (the fungus seed) lands on the moist rotting tree, it begins to grow rootlike strands. These strands release chemicals that dissolve the wood, so the fungus can absorb it. You've probably noticed mushrooms, the fruits of fungi, popping out of the forest floor after a warm rain. Mushrooms shed millions of spores, but only a few land on good growth sites.

BACTERIA ARE ALSO plants. Although they are too small to see, they are responsible for breaking down wood and releasing the carbon that the oak took in as carbon dioxide to build its trunk and branches. Without bacteria, the Earth would have only enough carbon dioxide to support its plants for 40 years, because all the carbon would be locked up in living plants. So by returning carbon to the soil and air, bacteria help keep the forest—and the Earth—green.

Fungi, bacteria, insects, and animals will live off the dead oak for many years. Eventually the tree will start to crumble and mix in with the soil, making what is called *humus*. This type of soil is rich in nutrients, and good for new seeds to grow on. In fact, the seeds of some trees, such as hemlock and spruce, have a hard time getting started on the ground because there are so many other plants. These seeds thrive on a decomposing tree, where they can grow several inches off the ground.

Next time you're in the woods, take a closer look at the trees and large branches that cover the forest floor. They may look lifeless, but right underneath, the remains of other seasons are being turned back into soil. This is where the nutrients of the forest are released, so new plants can spring to life again. ■

Eileen Docekal *is a naturalist and environmental educator in Tulsa, Okla. She contributed "How Seeds Travel" to the July/August 1985 issue of* Sierra.

Downy woodpecker *Chipmunk* *Ferns* *Great horned owl* *White oak sapling*

Bull snake *Spider* *Turtle* *Opossum*

Life on the Mississippi

Great River: An Environmental History of the Upper Mississippi, 1890–1950
by Philip V. Scarpino.
University of Missouri Press, 1985.
$24, cloth.

Robert Weyeneth

ONE OF THE MOST illuminating approaches to environmental history is the regional case study. In *Great River*, Philip Scarpino takes as his subject the upper Mississippi River in the first half of the 20th century. He concentrates on the urban-industrial portion of the river between the Twin Cities (at the head of commercial navigation) and St. Louis (near the Mississippi's junction with the Missouri).

To tell the tale of this 700-mile section of the "Father of Waters," Scarpino emphasizes two important features of the river landscape: a dam and a wildlife refuge. Iowa's Keokuk Hydroelectric Project, completed in 1913, was the first large dam on the Mississippi and remains the river's only major hydroelectric facility. The wetlands that were protected within the Upper Mississippi River Wildlife and Fish Refuge in 1924 represented an important early conservation victory.

Professor Scarpino uses the dam and wildlife refuge as springboards to a larger story about regional economic development, environmental degradation, and the meaning of conservation before 1950. He points out that the history of the upper Mississippi between 1890 and 1950 reflects the clash of diverse and ultimately conflicting uses promoted by businessmen's clubs, commercial fishermen, the U.S. Army Corps of Engineers, wildlife biologists, metropolitan water districts, and citizen groups, and concludes that environmental history is best seen in terms of interest-group politics.

Scarpino begins his story in the 1890s, as midwesterners attempt to harness the Mississippi to the needs of their industrializing society. The river of steamboats and small homesteads is thus transformed to fit an "industrial discipline." To improve commercial navigation, engineers tried to create a stable, predictable body of water with a constant depth. Farmers and city dwellers drained floodplains for agriculture and urban centers. The dam at Keokuk was followed in the 1930s by 25 other dams and locks, which converted the upper Mississippi into a series of slackwater reservoirs. Only slowly did people appreciate the unanticipated consequences of river development: siltation, disappearance of wetlands, concentration of municipal sewage and industrial toxins, and the destruction of fish and wildlife habitats.

But Scarpino's book also sounds an optimistic note. As urbanization and industrialization took their toll, a citizen group mobilized. Due in considerable part to the efforts of the Izaak Walton League of America—a collection of urban sportsmen who organized in 1922 to preserve the recreational and aesthetic amenities of the American outdoors—the federal government in 1924 created the Upper Mississippi River Wildlife and Fish Refuge to preserve wetlands from drainage along a 300-mile stretch of the river that runs through Minnesota, Wisconsin, Iowa, and Illinois.

Scarpino argues that the League's campaign represented a significant and successful application of the tactics and arguments pioneered by the Sierra Club in its earlier, unsuccessful battle to prevent construction of a dam in Yosemite's Hetch Hetchy Valley. By organizing grassroots pressure, expert testimony, and direct congressional lobbying, the Izaak Walton League assembled "all the elements of the first modern environmental campaign."

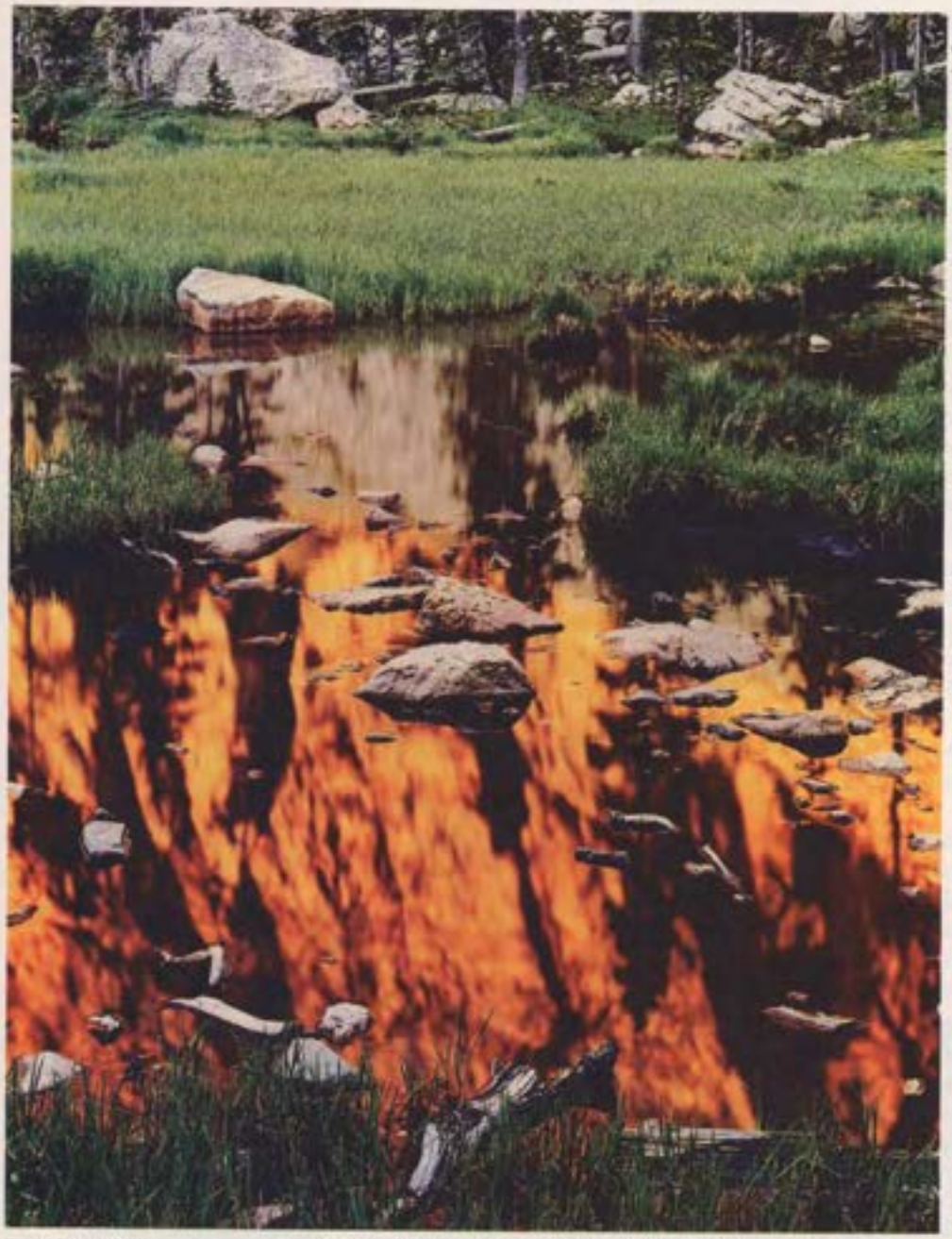
Some readers of *Great River* may wish the author's net had been cast more widely. The Mississippi River Valley represents a distinct cultural and geographical unit—a bioregion, in the current parlance—that might fruitfully be

studied in its entirety; yet this book discusses only the upper river. Even this limited territory is circumscribed further with an idiosyncratic definition of it as the 700-mile section between the Twin Cities and St. Louis, curiously omitting the 500 miles upstream from Minneapolis and St. Paul.

This omission neglects half the story. It also perpetuates an unfortunate myth about the Mississippi. Most Americans regard the 20th-century river as an urban-industrial sewer best dismissed as a national sacrifice area. But the Mississippi is actually two rivers: a wilderness river and a river of history. Most people outside Minnesota and Wisconsin may be surprised to learn that above the Twin Cities the Mississippi becomes a largely unspoiled and spectacular recreational river, parts of which deserve to be protected in the U.S. Wild and Scenic River System.

Great River's temporal breadth is similarly restricted. The story ends abruptly in 1950, with no discussion of changes that have occurred during the last 35 years. Yet biological and industrial wastes in runoff from farms, feedlots, and city streets continue to pollute the river. The Twin Cities are still the single worst source of pollution on the upper river, contributing the effluent from the infamous Pig's Eye Wastewater Treatment Plant as well as a range of post-war industrial toxins. The existence of PCBs and heavy metals in the river has had enormous impact on fisheries, resulting in a ban on commercial fishing in 1975.

Perhaps the most vexing contemporary questions center on the ecological consequences of turning the Mississippi into a shipping lane and series of reservoirs. The dredging required to maintain a constant, deep channel has deposited debris that is changing shoreline habitats. Since the 1930s, 26 locks and dams have altered the flooding cycle of the river, submerging floodplains and changing aquatic habitats. The slowed current has inhibited the meandering process and accelerated siltation. Lost wetlands are not being replaced, and many estimates sug-



Rio Grande: Mountains to the Sea
Jim Bones
Texas Monthly Press; $35

The Rio Grande helps define a variety of landscapes, from the great sand dunes of southern Colorado to the canyons of the Big Bend. Jim Bones' work shows the river in all its forms and phases. (Above, "Sunset reflection in Nambe Lake.")

gest that the remaining backwaters may be gone within 50 years, with ominous implications for the survival of wildlife habitats and water quality.

Most recently the debate has focused on the Army Corps of Engineers as it proceeds to enlarge the southernmost lock at Alton, Ill. Environmentalists fear that the project is a prelude to deepening the channel and expanding the entire upper river navigational system, which would increase disruptive barge traffic and hasten environmental decline.

On a cheerier note, the controversy has stimulated renewed interest in a master plan for the upper river. In 1982 the Upper Mississippi River Basin Commission, composed of representatives from nine federal agencies and six state governments, submitted a comprehensive plan recommending that the river be managed as a nationally significant ecosystem as well as a commercial waterway. It remains an open question, however, whether the Mississippi can be a healthy natural system when so many Americans place such high demands upon it. Its environmental history over the next century will reveal whether the river can be both a viable aquatic habitat and a major shipping canal.

Robert Weyeneth is an assistant professor of American Studies at the University of Hawaii, where he teaches environmental history.

Oh! What a Tangled Web

An Environmental Agenda for the Future
edited by Robert Cahn.
Island Press (Dept. F, P.O. Box 53406, Washington, DC 20009); $6.95, paper.

Mark Vaz

THE CHIEF EXECUTIVES of ten major environmental organizations (including the Sierra Club, National Audubon Society, and Friends of the Earth) have pooled their resources to write an educational tool "in the American tradition of citizen action." Eleven major subject areas are presented here, ranging from popula-

tion growth and land use to energy strategies, toxics control, and the urban environment. Each area represents one strand in a web of destructive global tendencies. The complexity of the issues makes their solution all the more difficult, because strategies effective on the regional or even national level will not ultimately close the book on problems confronting people worldwide.

Human population growth is one example of a problem that goes beyond the limits of national boundaries or ideologies. In countries from Asia to Central America, population pressures have already reduced the yields of the biological systems necessary to sustain human life. A compelling example is Haiti, where the birth rate is among the highest in Latin America. To meet the needs of their expanding population, Haitians have cut an estimated 80 percent of their timber area, allowing valuable topsoil to be washed into the sea by tropical rains. The loss of soil combined with the effect of hot sun baking the exposed ground and limiting the earth's ability to retain rainwater has caused many Haitians to abandon their lands, now worthless and dead, to emigrate to other lands—such as the United States.

Worldwide biological systems will continue to feel the pressure of human numbers. With more than 6 billion people expected to crowd the planet by the year 2000 (up from today's total of 4.8 billion), humankind can be expected to sink lower in nature's deficit column.

Agenda for the Future illustrates how traditional policymaking hinders our response to global problems. There is, for example, the horse-and-buggy method the U.S. government employs in addressing the health threats posed by 65,000 toxic chemicals Americans are potentially exposed to in the course of daily life.

Our standard approach to regulation of these substances, emphasizing control on a statute-by-statute, medium-by-medium, chemical-by-chemical basis, is clearly not sufficient. One of the contributors' recommendations is that the U.S. drop its insistence on separate studies for each chemical. Studying and controlling groups of "chemical cousins" that display similar properties and levels of toxicity is one way to change

"Forty years ago I had a back-alley abortion. I almost died from it."

If you wonder whether legal abortion is a good idea, ask any woman who survived an illegal one.

She'll tell you how painful, dirty, humiliating, and horribly dangerous a back-alley abortion was.

But despite the incredible risks, millions of American women had abortions before they were legalized nationwide in 1973. An untold number were maimed for life. Thousands were literally slaughtered, packed off bleeding and infected to die in abject terror.

Today the threat to women's lives and health no longer comes from abortion. It comes from those who want to outlaw it. People who argue that abortions should be banned—even if the result will be as horrifying as it was in the past.

This increasingly vocal and violent minority will stop at nothing. They've resorted to harassment, physical threats, and even bombings. They're attacking the Constitution. And they're pressuring lawmakers to make abortion illegal again—for all women. Regardless of circumstances. Even if her life or health is endangered. Even if she's a victim of rape or incest. Even if she's too young to be a mother.

Speak out now. Use the coupon. Or they just might succeed in turning back the clock to when women had no choice. But the back-alley.

The decision is yours.

☐ I've written my representatives in Congress to tell them I support: government programs that reduce the need for abortion by preventing unwanted pregnancy; and keeping safe and legal abortion a choice for all women.

☐ Here's my tax-deductible contribution in support of all Planned Parenthood activities and programs: ☐ $25 ☐ $35 ☐ $50 ☐ $75 ☐ $150 ☐ $500 or: $_____

NAME

STREET-CITY-ZIP

Planned Parenthood®
Federation of America, Inc.

810 Seventh Avenue
New York, New York 10019

our current cumbersome and paralyzing regulatory system.

Agenda keeps coming back to the need for more information and increased worldwide citizen involvement as part of a fresh, new problem-solving approach. "If focused and directed," the study concludes, "the sense of purpose and human potential that all people share will be adequate to persuade decision-makers to correct the serious resource, population, environmental, and development conditions that affect the world."

This is a working document, not a final solution for achieving global harmony with the Earth's natural systems. Ultimately such goals and their implementation will depend on the informed actions of the planetary public.

Mark Vaz *is Sierra's editorial intern.*

Enough to Drive You to Drink

Troubled Water: The Poisoning of America's Drinking Water
by Jonathan King.
Rodale Press, 1985. $8.95, paper.

Michael Castleman

RECENTLY I opened my newspaper to discover that one of my favorite beverages, Calistoga mineral water, has been found to contain fluoride far in excess of federal standards. Authorities agree that it poses no health hazard, but still, one wonders. I'd always assumed that Calistoga was pure, clean, and wholesome. After all, it's *spring* water, not runoff from a scum-topped pond. It's also bottled, and therefore (so I thought) better than the questionable liquid that flows from the tap.

I would have been less surprised had I already read Jonathan King's truly eye-opening book. King, an award-winning journalist with the Center for Investigative Reporting in Washington, D.C., and researcher Matt Rothman have exhaustively investigated America's drinking water. What they found makes their book's ominous title look like an understatement.

Our waters are a good deal more than troubled. Unfortunately, the full extent of the problem took decades to materialize, because the crisis is not concentrated in the visible 4 percent of the nation's water found in rivers, lakes, and streams, but in the 96 percent that remains underground. Groundwater supplies drinking water to half the U.S. population, and to 90 percent of rural residents.

Once considered immune to pollution, groundwater turns out to be more sensitive to contaminants than surface waters. Groundwater concentrations of trichlorethylene (TCE), an industrial solvent and suspected carcinogen, have been measured as high as 510,000 parts per billion, more than 3,000 times the highest level ever recorded in surface waters. King cites EPA reports that identified 700 hazardous chemicals in the nation's drinking water, with 34 states reporting "serious pollution."

In meticulous detail, King documents the many sources of this pollution. Some of these—toxic industrial wastes and pesticides—are only too familiar. Pollution from these sources is certainly a problem, but it accounts for only a fraction of all groundwater pollution.

Another important source is the very treatment that's supposed to give us pure water. Sanitary engineers, long accustomed to adding chlorine to drinking water to kill harmful bacteria, have come to believe that "if a little is good, more must be better." But when chlorine reacts with the organic matter ubiquitous in "raw" water, new and potentially carcinogenic contaminants form. The EPA now ranks these contaminants, called trihalomethanes (THMs), as the leading organic chemical pollutant of the nation's drinking water.

And then there's the issue of plastic (PVC) pipe. It not only introduces suspected carcinogens into water that flows through it, but also allows toxic chemicals in the soil to seep into the pipe.

Most astonishing is King's chapter on the nation's top water polluter. It's not the chemical industry, but the U.S. armed forces. Our military produces more hazardous wastes each year than any corporation, and thousands of homes near dozens of military bases can no longer use their groundwater for

anything—even washing—because it's so contaminated. To make matters worse, during his first term President Reagan exempted the military from all EPA water-quality regulations.

Speaking of the EPA—an acronym that King suggests stands for the "Everything is Permitted Agency"—it has set standards for only a minute fraction of toxic pollutants, and its enforcement record is so dismal that one might mistake it for a wholly owned subsidiary of Dow Chemical.

So what's a health-conscious person to do? Switch to bottled water? Install a home water filter? The former can cost a dollar a gallon, and King cites disturbing studies showing that bottled water may be more contaminated than what flows from the tap. Home water filters cost about $300, and unless the filtration units are changed regularly, they may breed bacteria and release pollutants back into tap water.

But despite all this bad news, *Troubled Water* rises above the gloom and doom one has come to expect from environmental journalism. It's actually quite empowering—even refreshing in the end. King urges consumers not to jump for bottled water or home filters right away, but rather to have their drinking water tested first to find out what's really in it. WaterTest Corp. of Manchester, N.H., (1-800-426-8378) checks water samples for all major pollutants for about $350. King explains how to obtain clean bottled water and how to use home filters effectively if tested water shows contamination.

***Michael Castleman**, editor of* Medical Self-Care *magazine, contributed "Toxics and Male Infertility" to the March/April 1985 issue of* Sierra.

BRIEFLY NOTED

Green Mountain Adventure, Vermont's Long Trail by Jane and Will Curtis and Frank Lieberman (Green Mountain Club, Montpelier, VT; $9.95) celebrates the 75th anniversary of the Green Mountain Club, "founder, sponsor, defender, and protector" of the trail that runs the length of Vermont, from Haystack Mountain in the south beyond Camel's Hump and Mt. Mansfield. The book is lovingly designed,

SIERRA

READER SERVICE REPLY CARD

Please print or type

Dr. ☐ Ms. ☐ Mr. ☐ Mrs. ☐

Name _____

Address _____

City _____ State _____ Zip _____

Are you a member of the Sierra Club?
Yes ☐ No ☐

Is this your own copy of *Sierra*?
Yes ☐ No ☐

Circle the numbers that correspond to those listed on the opposite page.

Free brochures and catalogues

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48		

Priced literature

49	50	51	52	53	54	55	56	57	58
59	60								

Do not use after May 31st, 1986 M/A 1986

1. Handling fee $ 1.00
(Orders without handling fee cannot be processed)
2. Priced literature $ _____
Total Enclosed $ _____

Send reply card with check or money order (payable to *Sierra* Magazine) to:

Sierra Magazine
Reader Service Management Dept.
P.O. Box 375
Dalton, Massachusetts 01227-0375

How To Use This Fast Action Form

To receive information from an advertiser listed on the reader service page, circle the appropriate number on the reply card and enclose your check or money order made payable to *Sierra*. Orders without the handling fee of $1 cannot be processed. Don't forget your name and address. Allow six to eight weeks for delivery of most items.

Mail the reply card and your remittance in an envelope to:

Sierra Magazine
Reader Service Management Department
P.O. Box 375
Dalton, Massachusetts 01227-0375

READER SERVICES

Free brochures and catalogs

1. Aquaterra For information concerning the chinook touring kayak and accessories, send for this free package.

2. Adventure Center Affordable worldwide adventure travel. Treks, wildlife safaris, expeditions, and more.

3. Audio Forum Learn a foreign language on your own. Full-length courses in 42 languages. Free catalog.

4. Clair Tappaan Lodge Send for more information about the Sierra Club's own mountain lodge.

5. College of the Atlantic Send for our brochures, catalog, program descriptions, graduate and financial-aid information.

6. Columbia Pacific University Free catalog. Largest nonresident U.S. graduate university offers management, psychology, law, engineering, and other majors.

7. East Wind Arctic Tours Wildlife photo safaris, canoeing, backpacking, fishing.

8. Folbot Quiet, comfortable, easy to paddle. More stable than a canoe or kayak. Folding, Rigid kits.

9. GMI Photographic, Inc. Take better pictures! Send for information about Bronica cameras and the Cullman Outdoors Kit.

10. Geo Expeditions Wildlife and cultural expeditions to Africa, Central and South America, and Southeast Asia.

11. Government of the Northwest Territories Free big, colorful travel planner. 1986 Explorers' Guide.

12. Hans Klepper Most comprehensive illustrated information on famous Klepper Folding Kayaks. Historic reference material on sea kayaking, sailing.

13. High Desert Adventures The ten most accessible and affordable oar trips down the Colorado River. Free catalog.

14. Himalaya, Inc. Small group trekking and cultural adventures in Nepal, China, India, Bhutan, Papua New Guinea, Japan. Experienced leadership.

15. Holbrook Travel Wildlife, ecology, hiking expeditions worldwide. Carefully arranged for small groups.

16. Hubbard Hubbard Raised Relief Maps are described and illustrated in free full-color brochure.

17. Inti Imports Beautiful handknit wool and alpaca sweaters, capes, shawls, scarves for adults and children, at very reasonable prices.

18. Lone Mountain Ranch Family guest ranch and Nordic-ski interpretive vacations in Yellowstone country. Free brochure.

19. Long John Shirts 23 colors and eight different styles. Send for our free catalog.

20. Minnesota Office of Tourism Summer Minnesota Explorer: 50 stories about places to go, things to do, places to stay.

21. Mountain Travel Treks, outings, and expeditions in Nepal, China, Peru, Africa, Alaska. Free trip schedule.

22. National Audubon Society Expedition Institute Send for free information packet describing B.S., M.S., secondary/junior-high or summer degree programs.

23. Nature Expeditions International Specialists in wildlife, natural history, and cultural expeditions worldwide, combining adventure, learning, and vacation.

24. Overseas Adventure Travel Safaris, treks, expeditions: walking, camping, and river safaris in Tanzania, Botswana, Rwanda. Treks in Nepal and Peru.

25. Planned Giving Program Life-income trusts and bequests provide tax and income benefits and support Sierra Club programs. Usually applicable to members over 55.

26. Prescott College Free catalogs, brochures, and posters explaining our experiential and interdisciplinary approach to the liberal arts.

27. R.E.I. Free spring catalog! REI offers one of the largest selections of outdoor equipment and clothing.

28. St. George Pribilof Island Tours Guided naturalist excursions to St. George Island, Alaska. Brochures available.

29. Save the Children Give a gift of Love. Sponsor a child for a friend. Send for more information.

30. Sundance Leather Send for our free brochure of handcrafted genuine leather handbags, carry-on bags, and backpacks.

31. Therm-A-Rest Therm-A-Rest self-inflating foam pads. Free brochure and dealer list.

32. Windjammer Discover the Caribbean with the ships that discovered the Caribbean. Explore uninhabited islands, shop native villages, dive in blue waters.

Priced literature

49. Banana Republic Authentic, classic, and comfortable travel and safari clothing for men and women. Mostly natural fabrics. $1.

50. Barnes & Noble Savings of up to 80 percent on books, records, tapes, and videocassettes from the "world's largest bookstore." $1.

51. Cerro Gordo Community Prototyping a sustainable future. Introductory book and visitor's guide. $2.

52. Coldwater Creek Put a little nature in your mailbox with our color catalog of unique, nature-related gifts. $1.

53. Fabiano Shoe Brochure available: hiking, backpacking, trionic boots, action footwear, X-C touring. 50¢.

54. Freshette™ by Sani-fem For women only! Freshette™ tames wilderness restrooms! Free brochure! Postage 22¢.

55. Hi-Tec Sports The company that re-invented the hiking boot. Send $1 for the latest full-color catalog.

56. Sevylor Manufactures recreational inflatable products. Catalogs and consumer brochures available upon request. 35¢.

Sierra provides a direct line of communication between our readers and advertisers. To receive information from a *Sierra* advertiser listed above, circle the appropriate number(s) on the reply card and mail the card and your check or money order (made payable to *Sierra*) to *Sierra* Magazine, Reader Service Management Department, P.O. Box 375, Dalton, MA 01227-0375.
Please allow six to eight weeks for delivery of most items. Although each advertiser has assured us that it will respond to each request, *Sierra* is not responsible for any failure to do so.

with loads of period photographs. . . . Another anniversary—Canada's National Parks Centennial—is celebrated by Michael Burzynski in ***A Guide to Fundy National Park*** (Douglas & McIntyre, dist. by Salem House; $7.95). Naturally, the famous bay's giant tides are explained in detail, but the author also guides the reader through other areas of the park, including the flat upland area traversed via the Caribou Plain Trail and the "haunting landscape" of Devil's Half Acre. . . . ***Walks & Rambles on the Delmarva Peninsula*** by Jay Abercrombie (Backcountry Publications, Woodstock, VT; $8.95) is a hiker's guide to an agrarian area shared by Delaware, Maryland, and Virginia, seemingly remote but easily accessible to millions of East Coast residents. The reader can select from a variety of walks, ranging from a leisurely stroll through colonial New Castle to a 13-mile hike across Chincoteague National Wildlife Refuge. . . . Completely revised and expanded editions of ***101 Hikes in the North Cascades*** and ***102 Hikes in the South Cascades and Olympics*** are available from The Mountaineers–Books ($9.95 each). An entirely new guide to the Alpine Lakes Wilderness (also $9.95) adds another hundred routes to the Cascades hiker's repertoire, and will hopefully reduce pressure on this spectacular area's most popular trails. . . . ***Easy Day Hikes in Yosemite*** by Deborah J. Durkee (Yosemite Natural History Association, P.O. Box 545, Yosemite, CA 95389; $4.50) describes 20 mostly easy or moderate routes throughout the park that are especially suitable for children. Charming line drawings and functional maps complete the package. . . . A cyclist's guide with a hedonistic theme, ***Grape Expectations in California*** by Lena Emmery and Sally Taylor (1442 Willard St., San Francisco, CA 94117; $6.50) features 15 tours of three vinous regions, ranging from Mendocino as far south as the Santa Ynez Valley. Wineries of special interest are singled out, of course, while campgrounds and bed-and-breakfast inns are also listed. . . . Less a trail guide than a descriptive picture book, ***Classic Walks of the World***, edited by Walt Unsworth (Oxford Illustrated Press, dist. by Interbook; $14.95), presents photo essays on walks, climbs,

and treks around the globe: Karakoram to Cordillera, Corsica to Kilimanjaro. . . . A revised edition of Lee Cooper's ***How to Get to the Wilderness Without a Car*** has been published by Frosty Peak Books (P.O. Box 80584, Fairbanks, AK 99708; $9.95 + $1 postage). Many conservation-minded hikers would take public transportation to the edge of wilderness if they could; this book identifies numerous bus, train, and ferry drop-off points within three miles of trailheads in the western U.S., Alaska, and western Canada. Highly recommended. . . . A historical survey, ***Technological Utopianism in American Culture*** by Howard P. Segal (University of Chicago Press; $30 cloth, $14.95 paper) looks at how the schemes and dreams of 25 American visionaries between 1833 and 1933 promised paradise on Earth—often at the cost of our irreplaceable natural heritage. . . . Recent additions to *Montana Magazine*'s "Montana Geographic" series (Helena, MT 59604) include ***Montana's Explorers: The Pioneer Naturalists, Montana's Yellowstone River***, and ***Montana's Indians: Yesterday and Today***. Beautifully and profusely illustrated with maps, photos, and period artwork, each book in the series (there are 11 so far) will appeal not only to Montanans but to all lovers of western history and geography. . . . In ***The Audubon Society Guide to Attracting Birds*** (Scribners; $24.95) Stephen W. Kress provides exhaustive information to help you attract a variety of avian species to your yard. Its wealth of data makes this book a virtual encyclopedia of bird behavior and management. . . . ***Animal Extinctions: What Everyone Should Know***, edited by R. J. Hoage (Smithsonian Institution Press; $9.95), is based on a series of presentations at a 1982 public symposium on species extinction and its global implications held at the National Zoological Park in Washington, D.C. Contributors include Norman Myers, Paul Ehrlich, and Thomas Lovejoy. . . . The League of Women Voters' Education Fund has produced ***The Nuclear Waste Primer*** (Nick Lyons Books; $5.95) to provide a nontechnical introduction to this important topic. The sections on citizen involvement are especially useful. ■

BIKE TOURS

Meander from castle to castle on the backroads of the **real** Europe and New Zealand. Two week tours with hotels and escort vehicle.

GERHARD'S BICYCLE ODYSSEYS
4949 S.W. Macadam (503)
Portland, Ore. 97201 223-2402

Ocean Journeys

Northwest coast, Galapagos, Baja, Hawaii, by sail or sea kayak.

Natural history expeditions. Killer whales, Blue whales, Grey whales. Expert naturalist guides, photographers. Free brochure.

Northern Lights Expeditions
Dept. S, 5220 N.E. 180th
Seattle, WA 98155 (206) 302-4506

CHINA: BEYOND THE WALL

Unique and adventurous trips to wild and newly "opened" parts of China. We offer more countryside and contact with people; less cities, busses, museums.

Mountain Biking - Eastern Tibet Grasslands/20 days includes 8 days riding
Horseback - Inner Mongolia/21 days with 8 days riding
Walking - Wolong Pandа Reserve/24 days
Exploring Tibet - Lhasa, Kunming/23 days

Our trips are exhilarating, not strenuous. Some experience may be required (horseback). Write for details or call and talk with one of our trip leaders.

BOOJUM EXPEDITIONS Box 3336, Leucadia, CA 92024
619/436-3927, Telex 857348 (BOOJUM SDG)

Canoe Canada's Arctic

7 - 19 day expeditions

Fly-in canoe trips into the heart of North America's last great wilderness - the tundra & taiga of Canada's Northwest Territories. Discover the warm dry summers, spectacular scenery & unparalleled wildlife concentrations of a land untouched by man. Photograph caribou herds, white wolves, muskox, moose, grizzlies & rich birdlife. Virgin fishing for lake trout, grayling, northern pike.

Small groups (8 persons max.) assembled, outfitted & guided by Alex Hall, wildlife biologist & veteran arctic canoeing guide. CAN ACCOMMODATE A LIMITED NUMBER WITH NO PREVIOUS CANOEING EXPERIENCE. Season: June 1 - Sept. 15. Operating the most remote wilderness expeditions in North America since 1974. For brochure write:

CANOE ARCTIC INC.
P.O. Box 130M
Fort Smith, N.W.T. Canada
X0E 0P0

KENYA WILDLIFE SAFARI
★ 17 day - $2960 Air/Land Seattle
NEPAL ANNAPURNA TREK
★ 14 day - $1980 Air/Land Seattle
48 page Adventure Catalog available

FOLKWAYS INTERNATIONAL TREKKING, INC.
14905 S.E. Linden Lane Oak Grove, OR 97267
503-653-5882 800-547-7400 USA

BRITAIN'S COASTS

Explore & Discover

- Scenic Footpaths
- Fascinating History
- Wild Moors, Birds, Flowers
- Delightful Inns

Small guided groups, easy walking tours. Phone or write for free descriptive color brochure

BRITISH COASTAL TRAILS Inc. Tel. 203-329-1612
79-B Country Club Rd, Stamford, CT 06903

GREEK ISLAND

Hiking/Backpacking Trip
Sept. 13-27, 1986 — Island of Samos
Laughing Otter Adventure Tours
4045 D Foothill Rd.
Santa Barbara, CA 93110
(805) 967-3746

NEW ZEALAND & AUSTRALIA

Walkabouts

Nature, Hiking & the Outdoors

A selection of escorted and independent tours featuring New Zealand's scenic National Parks & Milford Track; Australia's Outback, Far North, & Great Barrier Reef. Extensions to Tahiti, Fiji, & New Guinea

Write for descriptive brochure:
PACIFIC EXPLORATION CO.
Box 3042-S
Santa Barbara, Calif. 93130
(805) 687-7282
Travel Adventures in Natural History

SWISS ALPS

Moderate DAY hiking tours, 2 or 4 weeks. Ride up above tree line and hike down. Over 50 optional length hikes basing one week at 10 charming mountain villages in 3 or 4 star hotels. Write for free brochure:

ALPINE ADVENTURE TRAILS TOURS
783 Cliffside Dr., #202
Akron, OH 44313
swissair

BIKE & HIKE OUR WORLD

Experience Nature, Cultures, People in Europe, Asia, Americas, Africa, Australia/New Zealand.
THE SLOW WAY.
Affordable programs, hotel or camping, basic to gourmet. Congenial American/International groups, top leaders.
FORUM TRAVEL INTL., 91 Gregory Lane (#21), PLEASANT HILL, CA 94523. (415) 671-2900

PERUVIAN AMAZON ADVENTURE VACATION

Enjoy moonlight excursions up the Amazon River. Take guided biological, birding, pictorial and zoological tours into the depths of the Amazon Virgin Forest. View of Halley's Comet, an unforgettable sight. Tour Lima and her Gold and Archeological museums. Special rates for 1986. Year round trips.

To support Local Conservation and Peruvian Children's Foundation.

Wilderness Expeditions,
(703) 342-5630
310 Washington Ave., SW, Roanoke, Virginia 24016

1986 WHALE CENTER NATURE ADVENTURES

featuring Whales of the World

Cruises/Wildlife Tours to Australia, Baja, Antarctica, Galapagos, Sea of Cortez, Alaska
Help Support Our Nonprofit Whale Conservation Efforts!

FREE CATALOG

Whale Center, 3929 Piedmont Ave., Oakland, CA 94611 (415) 654-6621

TREKPERU/*S. America Adventure*

Exotic Inca Trail & Cord. Blanca Treks, Amazon Adventure, Torres del Paine, Overlanding, Aconcagua, Galapagos & More. Informative guides/affordable.
1510 York #234-S, Denver, CO 80206; Tel: (303)320-0388x3

Sierra readership climbs to 370,000, and is still growing! Reach them in AdVenture.

europeds

Cycling, Hiking, and Kayaking
883 Sinex Ave.
Pacific Grove, CA
USA 93950
(408) 372-1613

Pedal the backroads of Europe.

Cycling tours in the French provinces:
8 unique itineraries. Paris to the Mediterranean; Pyrenees; River Gorges; North Brittany Coast; South Brittany Coast; Provence; Dordogne; Champagne/Burgundy.
Delightful inns, superb cuisine, mechanic, support van, experienced guides, 12-speed rental bikes available.

WILDERNESS JOURNEYS

RIVERS, OCEANS, & MOUNTAINS

Join whitewater paddling, natural history oriented adventures in **California, Oregon, Idaho** and **Alaska** . . . Join cultural, natural history, and art workshop treks to **French Polynesia, Swiss-Italian Alps, Japanese Alps, Italy, New Zealand,** and **Nepal.**

Unique, off-beat adventures with expert leaders and small groups.

Write for free catalog and detailed itineraries.

JAMES HENRY RIVER JOURNEYS
Box 8075, Bolinas, CA 94924
(415) 868-1836

RUCKSACK HOLIDAYS

ON FOOT THROUGH BEAUTIFUL BRITAIN

Southwest Peninsula Path, Avebury & Stonehenge, Dartmoor, Yorkshire Dales, Lake District staying at luxury hotels and tough backpacking trips on Pennine Way and Highlands of Scotland. All led by famous British outdoor writer. Brochure from Rucksack Holidays, 2186 Jackson Keller, Suite 520, San Antonio, Tx 78213. 512-826-9608 (after Jan. 5th).

Discover the isolation of **AUSTRALIA'S** National Parks * Immerse yourself in the Great Barrier Reef * Photography, ecology and other **VACATIONS** led by experienced naturalists.

Many programs, many dates.

RUNAWAY LEARNING VACATIONS
Bavarian Center No. 28
Boulder, CO 80303 (303) 499-2242

A-1 NATURAL HISTORY/WILDLIFE SAFARIS Escorted/Independent. **Africa:** Kenya, Tanzania, Rwanda, Zambia, Zimbabwe, Botswana, Trans-Sahara. **Asia:** India, Nepal, Malaysia, Indonesia. **S. America:** Brazil, Ecuador, Peru, Galapagos Islands, Alaska. Safaricentre International. Nationwide (800) 223-6046. California (800) 624-5342, Canada (800) 233-6046.

SAFARICENTRE

Worldwide Adventure for the discerning traveler

EUROPE Transylvanian Alps • Yugoslavia Spanish Pyrenees • W. Ireland
HIMALAYA Nepal • Bhutan Tibet • Ladakh

Plus — Japan, Peru, Yemen, Indonesia, New Zealand
Call or write for a free box from
Above the Clouds Trekking: P.O. Box 3985, Worcester, MA 01602 (800)233-4499 (617)799-4499

SIERRA ADVENTURE

europeds
Cycling, hiking, skiing Europe
883 Sinex Ave.
Pacific Grove, CA
USA 93950
(408) 372-1673

Hike the high trails of the Swiss Alps.

3 August tours featuring delightful chalet hotels, superb food, support van, expert guides.
- Two weeks through the awesome Berner Oberland.
- One week in the Engadine Valley (St. Moritz).
- One week hut-hopping at higher elevations (central Switzerland).

HIKING IN ENGLAND

Join a small international group hiking through the beautiful English countryside, with an experienced guide and hotel accommodation. Cotswolds, Yorkshire Dales, Exmoor, Dorset, Shropshire and Welsh Borders, South Downs and others. Brochure available.

FOOTPATH HOLIDAYS (E), 4 HOLLY WALK, ANDOVER, HANTS, SP10 3PJ, ENGLAND

K-2 EXPEDITION TREKS

Approach Trek — 12 May - 13 June
Mountain Medicine Trek — 12 May - 13 June
Summiting Trek — 16 June - 18 July
$5064 Land/Air Seattle

FOLKWAYS INTERNATIONAL TREKKING, INC.
14905 S.E. Linden Lane Oak Grove, OR 97267
503-653-5882 800-547-7400 USA

HIMALAYAN EXCURSIONS

Himalayan Excursions offers a wide variety of treks, river rafting and wildlife safaris in all parts of Nepal. For brochure please write or cable.

Himalayan Excursions
G. P. O. Box 1221
Kathmandu, Nepal

or Himalayan Excursions
P. O. Box 11204
Midland, Texas 79702

SKIING - BICYCLING - CANOEING

ADVENTURES
"Experience the ultimate vacations"
OFF THE DEEP END TRAVELS
P.O. BOX 7511-S
JACKSON, WYOMING
83001
1-800-223-6833
South Pacific - Orient - Europe - USA

Canadian High Arctic

Backpack expedition to unexplored wilderness area, in July. Limited to ten participants. Study and photograph rarely seen Arctic animals and plants.

Trip lead by Erwin Streisinger, biologist, with 25 years Arctic exploration background. Write for information and please describe your backpacking experience.

Erwin Streisinger
232 Elmwood Ave., Maplewood, NJ 07040

Payment deadline for the May/June issue is March 3. Don't miss it!

BACKPACK CANADA, UNITED STATES AND SOUTH AMERICA

Backpacking treks and Base Camps on trails in scenic, exciting mountain areas in the U.S., Canada, and South America. Adult, co-ed groups. We have a wonderful time. Send for a brochure. WILLARD'S ADVENTURE EXPEDITIONS, Box CO, Barrie, Ontario, Canada L4M 4S9 (705) 737-1881.

Willard's Adventure Expeditions

ENGLISH WANDERER

Hiking holidays with hotel accommodation.
Yorkshire Dales, English Lakes, Scotland, Cotswolds and others.
All grades from easy to tough.

English Wanderer (S),
13 Wellington Court, Spencers Wood,
Reading RG7 1BN, England.
Tel: 011-44-734-882515

TIBET

Trek Tibet and Nepal
Nepalese Staff, Equipment and Food by

HIMALAYAN ROVER TREK

P.O. Box 24382
Seattle, WA 98124

G.P.O. Box 1081
Kathmandu, Nepal

(206) 454-5022, (800) 846-9240 or (800) 443-4431

Want to Find the Right TREK?

Find a trek in the region and season of your choice, offering you just the right challenge, number of days, terrain, and cost. Choose the trip's emphasis between walking, rafting, climbing, culture, nature, or a mix. TREKINFO provides a computerized, current summary of 200+ treks in all parts of the Himalayas offered by major trekking companies. The easy-to-read format lets you find just the right adventure quickly. $4 to TREKINFO, 3491 Ivy Lane, Murrysville, PA 15668.

JADE DRAGON MOUNTAIN

CHINA TREK: Join an expedition to China's unexplored mountain areas: Jade Dragon Mountain, Yunnan Province, April 1986; Amne Machin, Qinghai Province, August 1986; Celestial Peak, Sichuan Province, Sept. 1986; Transhimalaya trek from Tibet to Nepal, Oct. 1986. Free brochure: China Trek, 2265 Westwood Blvd., Suite 777, Los Angeles, CA 90064. (213) 625-6092.

DOMESTIC TRAVEL

IDAHO WHITEWATER

The famous SNAKE, legendary SALMON and more! Offering the greatest variety of trips on the most Idaho rivers. Since 1979.

ROW

Small groups. Personal service. Color brochure.
(509) 534-2024
RL 12 Box 8544-J Spokane, WA 99223

ALASKA DISCOVERY

Alaska's oldest and most respected guiding company offers wilderness adventures by kayak, canoe, raft, backpack and skis. Completely outfitted expeditions into the wilds of Glacier Bay, Admiralty Island, W. Chichagof, Russell Fjord, Tatshenshini/Alsek & Stikine rivers. **Group and specialty trips** for photographers, fishermen. University credit available. Experienced, certified Alaskan guides. **Limited party size.**

For information write P.O. Box 26SC, Gustavus, AK 99826. (Ph. (907) 697-2257

EXPLORE THE MAINE COAST
Weekly Sailing Vacation
Windjammer "MARY DAY"

For Folder Write:
Capt. H.S. Hawkins
Box 798T
Camden, Maine 04843
207-236-2750

ON THE LOOSE
BICYCLE ADVENTURE VACATIONS
- Van Supported
- Country Inns or Camping
- California: Napa Valley, Gold Country,
- Hawaii and Oregon
- Rentals

FREE brochure: 1400 Shattuck Ave., Space 7, Box 55
Berkeley, CA 94709 415/527-4005

TEKLANIKA TOURS

"The Complete Alaskan Experience"

- Specializing in wilderness backpacking and river floating adventures from 2-10 days in the Interior and the Brooks Range
- Economically priced trips custom designed for small groups
- Resident Experienced Guides
- Remote Cabins

Box 10387 Curry's Corner, Fairbanks,, AK. 99710
(907) 457-7194

SEE AMERICA IN AN RV
Call American Safari toll free 800-327-9668
In Fla. 305-531-4202

America's Original Country Inn Bicycling Vacation

VERMONT BICYCLE TOURING

5-DAY & WEEKEND TOURS FOR ADULTS & FAMILIES
Cozy inns, bicycle rentals, van.
NEW! Stay aboard Lake Champlain schooner & ride or sail each day!

FREE
color brochure!

BOX 711-CB BRISTOL, VT 05443 (802) 453-4811

SIERRA ADVENTURE

HIKING COLORADO, INC.
Hike the beautiful San Juan Mountains in Southwestern Colorado. Enjoy a memorable vacation in the "Switzerland of America". Rush me a free brochure and application.

Name _____
Address _____
City _____
State _____ Zip _____
HIKING COLORADO, INC.
P.O. Box 2065
Colorado Springs, CO 80901
Phone 1-800-621-2766

HC

Wilderness River Adventures

Raft the river that carved the Grand Canyon. Exciting motorized and oar trips ranging from three to ten days down the Colorado River. Experienced guides, fabulous meals, and top quality equipment provided.

Del Webb's Wilderness River Adventures. Call collect 602/645-3296 or write P.O. Box 717, Page, AZ 86040.

BICYCLE TOURS – ALASKA, OREGON, WASHINGTON. Imagine cycling through pristine Northwest forests, alongside mountain lakes and relaxing in mineral hot springs; careening down the picturesque Oregon Coast; "Island-Hopping" in the San Juan Islands; cycling to the mouth of an Alaskan glacier and viewing bald eagles! TAILWIND OUTFITTERS invites you to God's Country. Choose from country inn or camping tours, weekend or full-week. Gourmet meals, support vehicle and experienced guides all inclusive. Tours for individuals or special groups. All levels welcome. Free catalog:
TAILWIND OUTFITTERS, INC.
4130 SW 117th Ave., Suite S-SC3,
Beaverton, OR 97005.
Phone (503) 641-2582.

WILDERNESS ALASKA

BROOKS RANGE — HIGH ARCTIC ADVENTURE

15 years safely guiding quality backpack and river tours throughout the Brooks Range. Special focus on wilderness skills and field biology unique to the arctic. Custom and scheduled trips. Write for brochure. **Write: WILDERNESS ALASKA, BOX 6092, KETCHIKAN, AK 99901**

OUTDOOR EDUCATION

OREGON'S WILD & SCENIC ROGUE RIVER

LEARN TO KAYAK. West Coast leader in whitewater Kayak instruction for thirteen seasons. Nine day basic courses-all equipment, instruction, comfortable accomodations, and a four day forty mile raft supported wilderness river trip. Shorter basic programs, intermediate and advanced programs. Write or call for details. (503) 479-8508
Sundance Expeditions, 14804 Galice Rd., Merlin OR 97532

Send your art and payment to: Sierra AdVenture, 730 Polk Street, San Francisco, CA 94109.

LEADERSHIP DEVELOPMENT COURSES IN COLORADO AND UTAH

Academic-length courses with credit available. Exciting, challenging, career-oriented. Raft, climb, hike, learn. 21-day summer multi-element courses available too!

WRITE: COLORADO OUTWARD BOUND SCHOOL
945 Pennsylvania St. Dept. 82
Denver, CO 80203 (303) 837-0880

NOBODY CAN SHOW YOU THE OKEFENOKEE SWAMP LIKE WE CAN!

Gain new understandings & new perspectives from EXPERT NATURALIST LEADERS.
Going yourself would be a rich experience. Going with us will be richer!
EXPEDITIONS INCLUDE
EVERGLADES • BAHAMAS • GREAT SMOKY MOUNTAINS • FLORIDA KEYS • TEEN'S CAMPS
sharing & caring with small groups since 1973

Wilderness Southeast
711-SA Sandtown Rd.
Savannah, GA 31410
(912) 897-5108
non-discriminatory • non-profit

ENVIRONMENTAL SCIENCE

IF YOU ARE NOT INTIMIDATED by science and math and want a secure career path, look into the undergraduate or graduate program in environmental science at University of San Francisco.

USF
Call (415)666-6553
or (800)CALLUSF

Outward Bound in North Carolina

Explore your potential as you backpack, canoe and rockclimb in the rugged Appalachians. Challenging individual and group activities enhance your understanding of self, others and the environment. Special courses for managers, educators, women, adults over 55. Financial aid available. Write or call for free information.

The North Carolina Outward Bound School
Dept 65 121 N. Sterling Street
Morganton, NC 28655 (704) 437-6112

VACATION RETREATS

SMALL - SPECIAL

Selway Lodge deep in Montana-Idaho's Bitterroot Wilderness. No electricity, no phone, no roads. Guests join trailride into Lodge. Cozy cabins. Tempting meals. Quiet. Secluded. Two week visit - $950 per person. Selway Lodge Box 1100-B, Hamilton, Montana 59840.

The Uncommon Vacation Experience
Tropical Villas
Mountain Chalets
Luxury Condos
Quaint Inns
Yacht Charters
800-843-4433
Hideaways International
P.O.Box 1464-SE Littleton, MA 01460

SECLUSION ON KAUAI

HANALEI BEACHFRONT RESORT. 2-bedroom suites, full kitchens, pool, lush gardens. Nearby 17 mile Na Pali Coast hiking, swimming, shelling and wilderness seclusion. $70-$115 a day.
TOLL FREE NATIONWIDE (800) 421-0767
P.O. Box 206, Hanalei, HI 96714 / (808) 826-6235
Hanalei Colony Resort

YOSEMITE WEST CONDOMINIUMS

8 Miles from Badger Pass ski area 15 miles from Yosemite Valley. All units contain TV, complete kitchens, fireplaces, 25% Discount, Oct. 1-May 1, Sun.-Thurs. excluding holidays. Located 1 mile off Hwy. 41, half mile south of Badger Pass/Glacier Pt. turn off.

Box 821, Yosemite, CA 95389
(209) 372-4711

Classic Coastal Charm.
• Beautiful Atlantic Views • Dining Rooms & Tavern
• Complimentary Breakfast

YORK HARBOR INN

YORK HARBOR - MAINE
For Reservations Call: 207-363-5119

KAUAI VACATION HOME

2 Bdrms, 2½ Bths. Fully furnished. Relax, Snorkel on Beautiful Beaches, hike Na Pali Trails.
Free brochure - Affordable prices
P.O. Box 2221, Saratoga, CA 95070
(713) 444-5988 or (408) 241-4288

Superb panoramic view over the Bay: Tamalpais — The Golden Gate — The San Francisco skyline with the Farallon Islands beyond, and more. Ideal for that very special home site. Four contiguous lots in the East Bay hills. Write to: **Properties, P.O. Box 5102, Berkeley, CA 94705.**

SCHIVELY RANCH

Working Ranch Adventures In Montana. A week of riding, roping, branding and trailing cows. Great for singles or entire family. Cookouts and hiking in the fresh open air. May-October. Write for brochure. Schively Ranch, 1062 Rd. 15, Lovell WY 82431 (307) 548-6688 evenings.

Call Lorraine Vallejo at (415) 923-5617

LLAMA PACK TRIPS

Wilderness trips with Llamas in N. Cal. Dine on delicious natural gourmet meals. Let us show you sights to inspire you with nature's PEACE and BEAUTY.

3R RANCH
(916) 926-5794
P.O. Box 3079 Dept S Mt. Shasta CA 96067

PRODUCTS/SERVICES

WILDERNESS PRESS
OUTDOOR BOOKS

THE HIGH SIERRA • THE TRINITY ALPS • YOSEMITE • CRATER LAKE • LASSEN • THE PACIFIC CREST TRAIL • ARIZONA MOUNTAINS • THE MARBLE MOUNTAINS • THE PACIFIC CREST TRAIL

Write for free catalog

2440C Bancroft Berkeley, CA 94704

Bird Poster, Free!

Winona, Minn. abounds in native & migratory birds. Free award-winning color poster, includes tour maps and birding tips. Ideal for all observers. Write:

Winona Convention & Visitors Bureau
Box 870D, Winona, MN 55987

RIDE OVER THE MOUNTAIN

Fascinating story! A woman's 8300-mile solo bicycle journey around America. Share the thrill of conquering the Rockies and the deserts, exploring both coasts—and spending a night in jail! $6.95 each.

M.J. Retallick, Box 90101-A, Pittsburgh, PA 15224

A HOT TUB FOR UNDER $400!

THE ORIGINAL . . . THE OFURO
JAPANESE SOAKING TUB

- Beautifully hand-crafted of select western cedar or redwood.
- Capacity for two adults.
- Completely assembled.
- Low cost, no maintenance, no chemicals.

FREE BROCHURE: CID CORP.
2622 S.E. Ellsworth Rd.
Vancouver, Wa. 98664
(206) 256-4508

Designer Jewelry

Handcrafted, nature's beauty. 24K gold and rhodium on solid sterling. Frog has gold back, silver feet & belly. 18" sterling chain & gift packed. Sierra Special $39.50 ppd. *Write for Free brochure.*

Silverspell INC. Box 50998, Dept S-1
Palo Alto, CA 94303
4140 Transport Street, Palo Alto, CA 94303

KITES!

FREE COLOR CATALOG
Choose from over 100 exciting kites.
• Many unusual & innovative designs •
Call or write for your free catalog today!

Into The Wind
2047-E Broadway, Boulder, CO 80302 • (303) 449-5356

ENVIRONMENTAL OPPORTUNITIES

Monthly bulletin lists jobs throughout the U.S. Write for FREE descriptive brochure: EOS P.O. Box 670, Walpole, NH 03608.

Classic Cedar Wood Canoes.

Winter Prices!
Handmade by Maurice Picard, Jr., Huron Indian. Clear fiberglass covered. Strong; stable; light (49 lbs). Handles & looks beautiful. 13'8"-15' -16' -17' -18'. $769 to $969. Free freight. Free color catalog. Nearest dlr call 1-800-343-3432. Great Canadian, Water St., Worcester, MA 01604

Use Recycled Paper

Send for our **FREE CATALOG** of:

- note cards
- stationery
- typing paper
- copy paper
- computer paper
- printing paper

In the U.S., we throw away ½ of the entire world production of paper. That's 100 billion pounds a year going to the dump. Earth Care gives you the opportunity to choose recycled paper. Our paper is equal in quality to non-recycled paper, plus it requires less energy to produce, stops waste, and saves trees. Our **free catalog** includes paper samples and color prints of our notecards and stationery. Help us change the American waste ethic.

Earth Care Paper Co.
325-EZ Beech Ln., Harbor Springs, MI 49740

LEG POUCH

Money, Credit Cards, Passport
~ SUPER SAFE ~
FULL REFUND if not 100% convinced
Send $9.90 Ea. ... or request brochure ...
LEG-POUCH # 6
17002 Cotter Pl
Encino CA 91436

CLOTHING/EQUIPMENT

environmental T-SHIRTS

Share The Earth!

Support wildlife by wearing environmental t-shirts. (10% of profits go to environmental groups.)

FREE CATALOG!

Many designs. $9.45 ea. Heavy weight, 100% cotton t-shirts in S, M, L, XL in tan, blue, lilac & yellow.

JIM MORRIS P.O. BOX 2308 DEPT. BCA6
BOULDER, CO 80306 (303) 444-6430

Satisfaction Guaranteed! © 85 Jim Morris

ANCIENT ANASAZI ROCK ART

"Waving" Figure Design on:
Adult 100% Cotton T-Shirt S M L XL
Color: Desert Tan
Long Sleeve: $11.95 Short Sleeve: $9.95

"Flute Player" Design on:
Adult 100% Cotton "Long-John" Style Shirt
S M L XL (allow for a little shrinkage)
Color: Natural Long Sleeve: $16.95

Kids 50/50 T-Shirt S M L
Color: Gold Short Sleeve: $7.95

Infant 50/50 12 mos. size only
Colors: Pink or Blue $5.50

SEND FOR FREE BROCHURE
We Pay Shipping

Taylor Made / P.O. Box 866 / Little Rock, AR 72203

TALL MEN - FREE CATALOG

HAND KNITTED PURE WOOL SWEATERS
Extra Length in the Waist & Sleeves. Under $40
Many Styles Available.

Write For Free Catalog

ALSO: 100% PURE COTTON LONG SLEEVE SAFARI SHIRTS

HIGH SIERRAS
P.O. Box 5069
McAllen, Texas 78502

AERIE DESIGN Since 1976

Wildlife T-SHIRTS & GRAPHICS

Send for free catalog and full color, 18 x 24, snowy owl poster. Share of profits goes to wildlife rescue.

141 Blackberry Inn Rd., Weaverville, NC 28787
704-645-3285

What is the pink matter I sometimes see on high-elevation snowfields in late spring and summer? Is it safe to melt and drink this snow? (Richard Worth, Denver, Colo.)

The pink matter you refer to is a form of algae that is actually red . . . except that it is in fact green.

A number of species of green algae are found in the West, from northern Mexico to Alaska, and in other parts of the world. These algae—the most common being *Chlamydomonas nivalis*—grow near or above treeline. The red coloration is formed by beta carotenes that serve to protect chlorophyll in the algae's cells from high-intensity light (including ultraviolet rays).

Although no studies have been completed on the effects of drinking melted red snow, it is not considered advisable; undigestible material may have a laxative effect.

Can you provide me with information on the efficiency and safety of various lifejacket designs? (Barry Wilhelm, San Luis Obispo, Calif.)

The most common lifejacket used in America is the Type III, various models of which cost between $40 and $75 and bear a tag stating that they are "U.S. Coast Guard Approved." Unfortunately, this apparent endorsement is no guarantee of safety: 324 people drowned during a recent two-year span while wearing Type III jackets.

The problem is that in rough water, or when a person loses strength or becomes unconscious, Type IIIs can turn the victim face down. *Consumer Reports* judged 29 of 30 Type III models "not acceptable"; only the Sears Helmsman #63146 met the magazine's standards.

The Coast Guard eschews Type III jackets, opting instead for Type II "Float Coats," although these too can slip off in turbulence. Even wearing a Special Commercial Whitewater Type V model, a person who falls overboard can expect to go underwater—sometimes for extended periods.

"I favor wearing anything rather than nothing," says Wayne Williams, president of the National Transportation Safety Association. "But I'd only wear a Type III jacket where the water temperature was at least 70 degrees Fahrenheit and I knew that someone was nearby to pick me up."

Why is there controversy surrounding the use of lead versus steel shot in waterfowl hunting? (Tim Johnson, Los Angeles, Calif.)

Conservationists are worried about lead poisoning in the waterfowl population, especially its impact on endangered species such as the bald eagle and California condor. A 1973 environmental impact statement issued by the U.S. Fish and Wildlife Service found that between 2 and 3 percent of the nation's waterfowl population dies of lead poisoning each year. At present, 26 states prohibit hunting waterfowl with anything but steel shot.

Spent lead shot pellets remain on the soil surface and are picked up by waterfowl while feeding. The solution is not just a matter of substituting steel for lead shot. Many hunters prefer lead over steel because it is ballistically more efficient. Some say it's also more humane, citing studies that indicate that lead shot is more likely to kill a bird outright.

California still permits the use of lead shot. The California Department of Fish and Game (CDFG) Wildlife Investigations Laboratory has compiled the country's most extensive data on wildlife diseases. Waterfowl losses due to lead poisoning have been found to be between 1 and 7 percent of total losses to disease in California. (The remaining losses are caused by botulism and cholera.) This rate is quite low compared with the country as a whole; in the rest of the U.S., lead poisoning alone accounts for a higher rate of wildfowl death than do total losses to disease in California.

"Lead poisoning is not the problem here that it is in the eastern states," says Bill Grenfell, CDFG wildlife management supervisor. Compared to the hard-packed clay of the eastern states, the looser soil in the West allows lead pellets to sink below the surface. "Only four deaths related to lead poisoning have been recorded among the bald eagle population, none in the last four years," Grenfell adds, "and we have recorded about 500 bald eagles at one time in the Tule Lake area. We feel the loss is inconsequential; of course, for some people the loss of one eagle is too much."

Doug Smock

MEMBERSHIP FORM

☐ **Yes, I want to join!** Please enter a membership in the category checked below.

New Member Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS: If you are giving this membership as a gift, please enter your name below (we will send a special gift card in your name).

Donor Name _____

Address _____

City/State _____ Zip _____

MEMBERSHIP CATEGORIES

	Individual	Joint
Regular	☐ $ 29	☐ $ 33
Supporting	☐ $ 50	☐ $ 54
Contributing	☐ $100	☐ $104
Life	☐ $750	per person)

SPECIAL CATEGORIES

	Individual	Joint
Senior	☐ $15	☐ $19
Student	☐ $15	☐ $19
Spouse of Life Member	☐ $15	(annual dues)

All dues include subscription to Sierra ($6) and chapter publications ($1).

SIERRA CLUB

Mail To: Dept. J-159
P.O. Box 7959, San Francisco, CA 94120

Residents of Canada, please remit in Canadian funds to:
*308 47 Colbourne Street, Toronto, Ontario, M5E 1E3 (Eastern Canada)
*512 620 View St., Victoria, B.C. V8W 1J6 (Western Canada)

A GREAT MAGAZINE . . . AND A LOT MORE!

As you read this issue of *SIERRA*, consider what you receive as a member:

- *SIERRA*, our award-winning bimonthly magazine
- Discounts on Sierra Club books and merchandise
- Your local chapter newsletter with information on hikes and activities
- Worldwide trips and local day hikes
- An opportunity for involvement in setting policy for the Club as well as the satisfaction of knowing that you are helping make this world a better place

Dollar for dollar, your membership gets you more with the Sierra Club! For your convenience, a membership form is on the reverse side.

SIERRA CLUB

MEMBERSHIP FORM

☐ **Yes, I want to join!** Please enter a membership in the category checked below.

New Member Name _____

Address _____

City/State _____ Zip _____

GIFT MEMBERSHIPS: If you are giving this membership as a gift, please enter your name below (we will send a special gift card in your name).

Donor Name _____

Address _____

City/State _____ Zip _____

MEMBERSHIP CATEGORIES

	Individual	Joint
Regular	☐ $ 29	☐ $ 33
Supporting	☐ $ 50	☐ $ 54
Contributing	☐ $100	☐ $104
Life	☐ $750	per person)

SPECIAL CATEGORIES

	Individual	Joint
Senior	☐ $15	☐ $19
Student	☐ $15	☐ $19
Spouse of Life Member	☐ $15	(annual dues)

All dues include subscription to *Sierra* ($6) and chapter publications ($1).

SIERRA CLUB

Mail To: Dept. J-162
P.O. Box 7959, San Francisco, CA 94120

Residents of Canada, please remit in Canadian funds to:
#500 47 Colbourne Street, Toronto, Ontario, M5E 1E3 (Eastern Canada)
#512 620 View St., Victoria, B.C. V8W 1J6 (Western Canada)

WORLDWALKERS™

World-Class Walking Shoes

Vasque®

Division of Red Wing Shoe Company, Inc.

Soft Cushion Collar
Fits shoe snugly around the ankle.

Vadura™ Leather
Vasque exclusive full-grain leather is soft, supple, lightweight and specially treated to repel water.

Tapered Heel
Allows a natural "heel-strike," cushions shock to legs, ankles and feet.

Triäd™ Comfort Footbed
A 3-ply removable cushion insole is contoured and conforms to the foot. VASORBEX™ landing pad absorbs shock from heel-strike. The SUPRO™ arch lift controls rolling of the foot and provides excellent foot support. Radial "Flex Grooves" up front help foot to flex naturally while walking. The TRIAD™ footbed is covered with DRIVAC,™ an absorbent, knit nylon/cotton material that keeps your feet feeling dry all day.

Sturdy Stitchdown Construction
Retains the shape and long life of the shoe.

Extended Heel Counter
Pre-shaped heel counter extends forward on the instep side to provide extra arch support and reduce foot fatigue.

Pigskin Ankle Lining
Tough, full-grain leather is soft, durable and absorbent.

Padded Tongue
Fits softly across the top of the foot.

Durable, Double-Insole
Two-layered construction wicks moisture away from the foot. With built-in "Flex-Grooves" to enhance the natural walking motion up front.

Toe & Instep Lining
Draws moisture away from the foot, absorbs 300% of its weight in perspiration, yet dries out incredibly fast. Keeps feet feeling dry all day long.

Step-Flex™ Outsole
Exclusive VASQUE outsole is made of a special racing tire compound that provides flexibility, abrasion resistance and long wear.

Cushionaire™ Midsole
Cushion-wedge midsole is ultra-light, made with millions of tiny air pockets to provide excellent cushioning. You can feel the difference when you walk.

TREK. PERFORMANCE WITH A SENSE OF PROPORTION.

After decades of refinement, the optimum form of the bicycle frame is finally taking shape. Using advanced materials and aerospace technology, Trek introduces a line of state-of-the-art aluminum machines—the first to combine stiffness, strength, and shock absorption in the most advantageous proportions possible.

The quandry facing every framebuilder has long been to reconcile the contradictory requirements of light weight and optimal stiffness. Some welded aluminum frames from overly-stiff and heavy large diameter tubing. Others, citing tradition, sought the answer in flexible and inefficient narrow gauges.

Trek puts stiffness in its place. Fine-tuning the diameters of Trek's aluminum tubing results in increased rigidity in both the lateral bending and bottom-bracket torsional axis, while reducing in-plane shock to the rider.

Trek's solution, after applying sophisticated finite element analysis was simple—to define a radically new "midsize" tubing diameter as a function of the demands of the cyclist. Then, to develop a torchless bonding process utilizing internal investment-cast lugs that translates the inherent strength of these new materials into superior performance.

You'll never see these small works of art because Trek utilizes internal investment-cast lugs and frame members.

The result is a machine leading publications such as Bicycling magazine have hailed as "one of the best all-around racing bikes we've tested." With superior lateral stiffness for climbing, jumps in acceleration, and out-of-the-saddle sprinting. Increased in-plane shock dampening. And better bottom-bracket torsional rigidity to turn every ounce of energy into miles per hour. The new Trek aluminum bicycles.

TREK USA

American Technology in Bicycles and Framesets™